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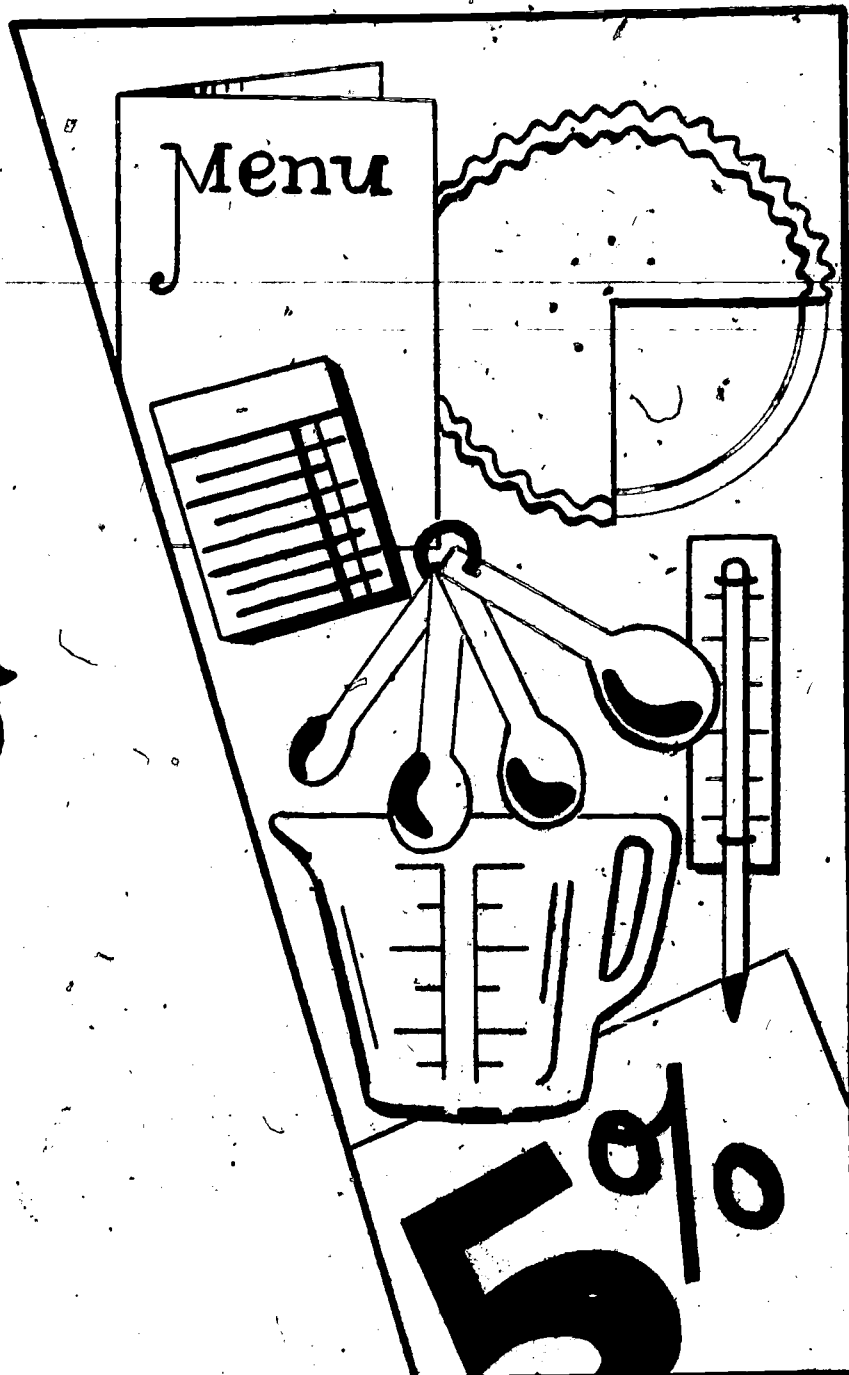   New Brunswick, New Jersey 08903 ($2.50)

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ABSTRACT
          A review of basic mathematics operations is presented
with problems and examples applied to activities in the food service
industry. The text is divided into eight units: measurement,
fractions, arithmetic operations, money and decimals, percentage,
ratio and proportion, wages and taxes, and business records. Each
unit contains a series of lessons which follow the format of stated
objectives, background information, demonstration or procedure, and
assignments. Recipes, guest checks, tax forms, and inventory sheets
accompany many of the lessons and serve as worksheets for doing the
assignments. A conversion chart showing the number of ounces
necessary to make tablespoons, cups, pints, and quarts for many foods
is included. (KJ)

STATE OF NEW JERSEY
DEPARTMENT OF EDUCATION
DIVISION OF VOCATIONAL EDUCATION

Menu

5%

mathematics for
COMMERCIAL FOODS

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Department of Education
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MATHEMATICS
FOR
COMMERCIAL FOODS

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3

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ACKNOWLEDGMENTS

i

To the Teacher

This text is intended to be used in the tenth year. It is the product of a number of years of teaching related mathematics. It is an attempt to improve the basic skills of the student while at the same time relating them to the student's shop experience. The author has attempted to reinforce each basic skill by relating it to a shop problem.

The order of the material presented is the order that the author has found most practical in actual classroom work. The work on measurements, which starts the book, is essential to recipe work. Fractions are needed early for the same reason. Then it's on with the material that generally starts off a more conventional text.

The author recommends working on income tax material in the text when supplemental material is available through the "Teaching Taxes program" issued by the IRS during January and February of each new year.

This is by no means a complete text. Each time the author has used the material, additions have been made to better prepare the student for the assignments.

The use of transparencies made from pages in the text is recommended. Pre- and post-tests, although not included, are well worth considering. The author has included material for bakers, although in a very limited way, because of class composition in his own school.

Your comments and suggestions are most welcome.

Norman Wersan

To the Student

Some knowledge of mathematics is necessary for every occupation, and Commercial Foods is no exception. You may have to change recipes, measure quantities of materials, fill out guest checks, operate the cash register, purchase foods, keep an inventory, and certainly receive wages and pay taxes. All these activities use mathematics.

This textbook provides a review of the basic math operations so essential to doing any mathematics work. In each unit the basic mathematics is applied to activities you will be doing in the food-service industry. There will be word problems and forms to fill out similar to the forms used in cafeterias and restaurants. All of the math in this book should be of help to you in your career.

Table of Contents

Unit V — Percentage

Unit VI — Ratio and Proportion

Unit VII — Wages and Taxes

Unit VIII — Business Records

Objective: You will learn the importance of standard measuring devices in commer-
cial foods.

Related Information:

Suppose you had a recipe that called for a tablespoonful of dry mustard. What if you didn't have a standard tablespoon? Suppose Company A made nice big tablespoons, and Company B made small tablespoons, and Companies C, D, and X each put out a different size. Would it make any difference in your recipe which tablespoon you had on hand? *You bet it would!*

In this world of ours, where everything from recipes to space-exploring vehicles depends upon measurements of one sort or another, *standard* measurements are absolute-ly essential. An inch must equal the same distance in California as in New Jersey; a pound must have the same weight in Oregon as in Florida; a pint must hold the same amount wherever you happen to be. If it were not so, no one could ever be sure of getting the same result as anyone else, whatever he or she tried to do. Machinery wouldn't work right, cars wouldn't run, buildings wouldn't stand straight.........The world would be a mess!

The problem is that, while all countries have standardized their own measure-ments, they do not all use the same units of measurement. We in the United States have the English system, based on pounds, quarts, and feet, while most of the countries of the world have adopted the metric system, based on grams, liters, and meters. Our country is expected to gradually change over to the metric system because of its simplicity. It is also a fact that many countries refuse to buy our machinery because it is not metric, and this has hurt our industries.

Our country has set up a Bureau of Standards in Washington, D.C., where there is the most accurate measuring equipment, along with the standards which all manufac-turers use as a check on their products. When companies make scales, weights, containers, etc., their design is based on the standards kept in Washington.

WHY IS A STANDARD IMPORTANT?

The term "cup" is used very loosely. We know that coffee cups vary in size, shape, and capacity, and yet they are all called cups. We cannot use these for accurate measurement in commercial foods. We must depend on commercially purchased measur-ing cups that are accurate.

If you measure your own weight and are off an ounce or more, it would not make much difference, but in weighing portions out, you must be accurate to the fraction of an ounce in some cases.

1

BASIC PRINCIPLES

1. We must select a measuring device which will be accurate enough for the job we assign it.

2. In general, the smaller the measurement we are making, the more accurate the measuring device must be.

3. A measuring device is only as good as the accuracy with which it is *used*.

4. Measuring devices must be periodically checked for accuracy and adjusted if necessary.

In the following pages we will discuss the various types of measures and measuring equipment in common use in commercial foods.

2

Lesson 2   **Units of Count**

Objective: You will gain skill in converting various units of count to other units.

Related Information:

      Items for commercial establishments are usually purchased in large quantities. Many are purchased by count. For that reason we must learn the various types of units we will deal with and how to convert from one to another.

<div align="center">

Units of Count (abbreviations in brackets)

2 pieces (or units) = 1 pair (pr)
12 pieces (or units) = 1 dozen (doz)
12 dozen   = 1 gross (gr)
144 pieces (or units) = 1 gross
12 gross   = 1 great gross (gt gr)

</div>

      Very often we need to convert from one unit to another. Sometimes we are puzzled as to whether to multiply or divide. Whatever type of measurement we are dealing with, we need only remember this general principle: There will always be *more* of a smaller unit, so we *multiply*; there will always be *fewer* of a large unit, so we *divide*.

      For example: How many pieces are there in 3 dozen? Well, a *piece* is a *smaller* unit than a *dozen*, so we *multiply*.

<div align="center">

3 dozen X 12 pieces in a dozen = 36 pieces

</div>

      How many gross in 42 dozen? In this case, a gross is a *larger* unit than a dozen, so we *divide*.

$$\frac{42 \text{ dozen}}{12 \text{ dozen in a gross}} = 3\tfrac{1}{2} \text{ gross}$$

ASSIGNMENT

1. How many dozen in a gross?   _____

2. How many eggs to a case? (30 dozen to a case)   _____

3. How many pieces in a gross and a half?   _____

4. If you needed 500 eggs, how many dozen would you need?   _____

5. How many cases would you have to order for problem #4?   _____

6. How many dozen in 3 gross?   _____

7. Write 4½ gross in terms of dozens.   _____

8. 468 dozen equals how many gross?   _____

9. 216 units equals how many dozen?   _____

3

10. 1,152 units equals how many gross? _____

11. 7-ounce cups cost $4.40 a dozen.
How much would 6 dozen cost? _____

12. 9-inch dinner plates cost $6.60 a dozen.
How much would a gross and a half cost? _____

13. 10-ounce water tumblers cost $1.70 a dozen.
How much would 3 gross cost us? _____

14. Serrated-blade knives cost $2.40 a dozen.
How much are they per knife? _____

15. In lots of 1 to 11 dozen, plain-blade knives cost $8.20 a dozen.
In lots of 12 to 39 dozen, they cost $8.00 a dozen.

     a. Difference in cost per dozen? _____

     b. Difference in cost per knife? _____

13
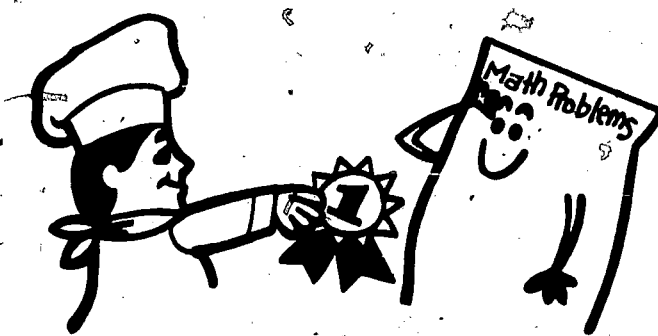
Lesson 3	Ways of Measuring Ingredients

Objectives: You will understand two of the main ways that ingredients can be measured.

You will know the principal units in each type of measurement.

You will understand the difference between fluid ounces and ounces of weight.

Related Information:

Anyone in the foods trade *must know* measurements.

There are two main ways of measuring ingredients — by *capacity (the size of the container)* and by *weight* (on a *scale*). Capacity includes both liquid and dry measures.

Ways of Measuring Ingredients

1. By capacity

   a. Liquid

   b. Dry

   } *teaspoons, tablespoons, ounces, cups, pints, quarts, gallons* (or cubic centimeters and liters).

2. By weight — — *ounces* and *pounds* (or grams and kilograms)

Now all of this would be clear enough except for one bad actor, known as the *ounce*. The ounce is really *two different* measures. Four ounces of cocoa would be weighed on a scale. Four "ounces" of vanilla really means 4 *fluid* (liquid) ounces, and would be measured out with a measuring cup. Ounces used to measure liquids are really fluid ounces, but the word "fluid" is often left out. Confusing, isn't it?

It is perfectly true that, for many substances, one fluid ounce weighs just about one ounce on a scale, but this is only approximate. You should understand that *the fluid ounce measures capacity* (volume, or size), while *the regular ounce measures weight.*

PRE—ASSIGNMENT:

Check as many places as apply to the following measures:

	Weight	Unit of: Liquid Measure	Dry Measure
1. Quart			
2. Pound			
3. Ounce			

14

5

ASSIGNMENT:

	Weight	Unit of: Liquid Measure	Dry Measure
1. Tablespoon	_____	_____	_____
2. Gallon	_____	_____	_____
3. Gram	_____	_____	_____
4. Liter	_____	_____	_____
5. Pint	_____	_____	_____
6. Cubic centimeter	_____	_____	_____
7. 2 ounces	_____	_____	_____
8. Cup	_____	_____	_____
9. Kilogram	_____	_____	_____
10. 4 teaspoons	_____	_____	_____
11. 6 pounds	_____	_____	_____
12. 3 fluid ounces	_____	_____	_____
13. 4 ounces	_____	_____	_____
14. 2 cups	_____	_____	_____
15. 10 pounds	_____	_____	_____

Lesson 4   Measures of Capacity

Objective: You will review the different units of liquid and dry measure, commonly used in the foods trade, and gain skill in converting from one unit to another.

Related Information:

Milk, water, oil, sauces, mayonnaise, soup stock, and similar liquid ingredients are generally measured by capacity (volume) rather than by weight. Dry ingredients such as salt, pepper, and spices are almost always measured by capacity, and such foods as chopped raw vegetables and fruits are often measured out rather than weighed.

The same measurements can be used for both liquid and dry ingredients. Some sizes are more likely to be used for one than for the other, but all can be used for either. You could, for example, have a teaspoon of vanilla as well as a teaspoon of salt. You could have a quart of milk or a quart of chopped celery. You could have a cup of rice as well as a cup of salad oil. In measuring dry ingredients, you know that the surface must be level if the measurement is to be accurate.

The following table of measurements should be memorized, except for the last two items, which you would not normally have to know.

Table of Capacity Equivalents — Liquid and Dry Measure
(Abbreviations in brackets)

3 teaspoons (t)	= 1 tablespoon (T)
2 tablespoons	= 1 fluid ounce (oz)
8 fluid ounces	= 1 cup (c)
16 tablespoons	= 1 cup
2 cups	= 1 pint (pt)
16 fluid ounces	= 1 pint
2 pints	= 1 quart (qt)
4 quarts	= 1 gallon (gal)
128 ounces	= 1 gal
4 gills	= 1 pt

When converting from one measure to another, remember that you *multiply* to get *more* of a *smaller* measure, and you *divide* to get *fewer* of a *larger* measure.

PRE–ASSIGNMENT

1. How many pints in 3 quarts?   _____

2. How many cups in 2 gallons?   _____

3. How many ounces in 8 tablespoons?   _____

ASSIGNMENT:

A. Find the number of:.

1. pints in 5 qts _____
2. cups in 3 qts _____
3. teaspoons in 2T _____
4. quarts in 10 pts _____
5. pints in 4 gal _____
6. pints in 13 c _____
7. tablespoons in 2 c _____
8. quarts in 3 gal _____
9. ounces in 10T _____
10. quarts in 2.5 gal _____
11. quarts in 6 gal 1 qt _____
12. cups in 5 pts. _____
13. gallons in 12 pts. _____
14. teaspoons in ½ c _____
15. cups in 3½ qts _____

16. cups in 16 oz _____
17. quarts in 9 pts _____
18. ounces in 6 t _____
19. quarts in 14 pts _____
20. ounces in 3 pts _____
21. gallons in 10 qts _____
22. tablespoons in ¾ c _____
23. gallons in 15 qts _____
24. ounces in 2½ c _____
25. ounces in 6 T _____
26. cups in 10 oz _____
27. tablespoons in 12 t _____
28. pints in 2 gal _____
29. teaspoons in 6 T _____
30. cups in 8 T _____

B. Express the following measurements as indicated:

1. 3½ cups to the nearest quart _____
2. 4 gal 1 qt. to the nearest gallon _____
3. 3½ pints to the nearest quart _____
4. 6 gal 3 qts to the nearest gallon _____
5. 9 qts ½ pint to the nearest quart _____
6. 15 cups to the nearest quart _____

17

8

A Puzzle for You

Here is a chart full of measurements. Each is equal to one or more of the other measurements. Fill in the *letters* of any other measurements equal to those of the letters listed below.

A 1/4 cup	B 3 cups	C 2 qt.	D 3/4 cup	E 1 tbs.
F 6 oz.	G 1/2 cup	H 16 oz.	I 3 tsp.	J 4 oz.
K 1 oz.	L 2 cups	M 2 pints	N 8 oz.	O 1 qt.
P 32 oz.	Q 1 gal.	R 24 oz.	S 2 oz.	T 1/2 oz.
U 1 cup	V 4 qts.	W 6 oz.	X 2 tbs.	Y 1 pt.

A. _____   I. _____   R. _____
B. _____   J. _____   S. _____
C. _____   K. _____   T. _____
D. _____   L. _____   U. _____
E. _____   M. _____   V. _____
F. _____   N. _____   W. _____
G. _____   O. _____   X. _____
H. _____   P. _____   Y. _____
Q. _____

18
9

Lesson 5   Measurement by Weight

Objectives: You will review the units of weight.
You will learn the different types of scales used in the foods trade.
You will learn several ways of measuring weight indirectly.

Related Information:

There is much less confusion in measuring by weight than by capacity. We know that 16 ounces equals 1 pound. Someday soon we will deal with grams and kilograms, but until that time comes we will

(1) Multiply by 16 to convert pounds to ounces.
(2) Divide by 16 to convert ounces to pounds.

Various types of scales are used in the foods trade.

Platform scale. This is a large scale used to weigh heavy quantities.

The items may be moved onto the scale by a hand truck. Everyone must get off the scale to take the reading. Another method of using the platform scale is to leave the hand truck on the scale so you save energy (and your back) and after taking the reading subtract the weight of the handtruck from the total weight.

Total weight on the dial:	245 lbs.
The hand truck weighs:	42 lb.
Therefore the material weighs:	203 lbs.

Balance scale. Used by bakers. Weights (metal pieces) are put on one side of the scale, and a pan on the other. When the scale balances you have the accurate weight. The weights may be in pounds, and the ounces can be read off on a sliding beam beneath the scale. Your instructor will demonstrate this scale.
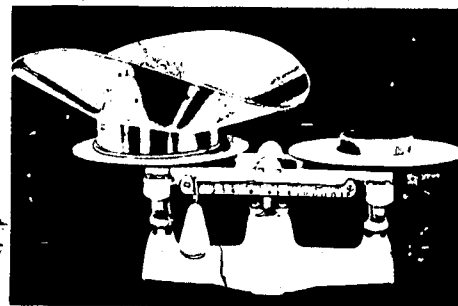
Penn Scale Manufacturing Co., Inc.

Baker's scale

Spring scale. Commonly used in the shop. Different types may be purchased, able to handle light or heavy weights. Spring scales may have special designs, such as the vegetable scale, or butcher scale.

Sometimes in the foods trade we weigh foods *indirectly*. Since a quart of many common substances (particularly liquids) weighs about 2 pounds, the cook is often able to weigh liquids by measuring them. (One can also measure liquids by weighing them – if it happens to be more convenient.) For most recipes this is accurate enough.

19

Example: A recipe calls for 3 qts. . . . . . Weigh 6 pounds of the liquid.

Example: A recipe calls for 4 lbs of water . . . . Measure 2 quarts.

In the same way, scoop sizes are a measure of capacity, but can be used roughly as a measure of weight. The number on the scoop tells how many of that size scoop make up a quart.

Scoop and Dipper Sizes

Scoop number	Approximate weight
8	5 oz.
10	4 oz.
12	3 oz.
16	2—2½ oz.
20	1 2/3 oz.
24	1½ oz.
30	1¼ oz.
40	1 oz

Ladles also are a measure of capacity. They too can be used to get an approximate weight of many substances.

Ladle Sizes and Approximate Weights

Ladle size	Approximate Weight
¼ cup	2 oz.
½ cup	4 oz.
¾ cup	6 oz.
1 cup	8 oz.

Counting by weight

You can make mathematics work for you and save time and effort when you have to count something. Assume someone wants to buy 200 of some item, say cookies. We sell cookies by the pound, not by the count.

Procedure: Place cookies one at a time on the scale until the scale reads one pound. Let us assume you counted 22 cookies. Therefore there are 22 cookies in one pound.

But the customer wants 200 cookies.

If you know how to work a proportion (we'll study proportion later), the easy way to get the proper number of pounds required is:

20

$$\frac{22 \text{ cookies}}{1 \text{ pound}} = \frac{200 \text{ cookies (wanted)}}{N \text{ pounds}}$$

$$22N = 200$$

$$N = 9 \text{ pounds (approx.)}$$

So you can weigh out 9 pounds of cookies and the customer will get about 200 of them.

Three of the most common ingredients used in cooking are sugar, fat, and flour. It happens that we can get fairly accurate weights of the three by using measures of capacity. Sometimes we will find this more convenient, and for many recipes the capacity measurements are accurate enough.

Approximate Equivalents

	2 cups water or milk	= 1 pound
	2 cups sugar (plus a little more)	= 1 pound
	2 cups fat (plus a little more)	= 1 pound
But	4 cups flour	= 1 pound

ASSIGNMENT:

1. How many ounces in a pound?

2. How many pounds in 40 ounces?

3. How many ounces in 5 pounds?

4. How many ounces in 10 pounds?

5. How many pounds in 12 ounces?

6. How many cups in a pound of fat?

7. How many cups of sifted flour in 1 pound of flour?

8. How many cups in 3 pounds of sugar?

9. A recipe calls for 2 pounds of milk.
   How many cups is that?

10. How many quarts of sifted flour are needed for a recipe calling for 8 lbs of flour?

21

Lesson 6   **Measuring Time**

Objective: You will gain skill in solving time problems that can arise in commercial foods establishments.

Related Information:

Time plays an important role in the operation of the commercial food establishment. Food is cooked for a certain length of time; you work and get paid by the hour; time schedules for employees have to be made out; and many of the activities you do involve a specified length of time. In a later unit you will be asked to time an operation in the shop and learn the importance of time and its relation to the cost of operating the shop.

Time Measures

60 seconds (sec)	= 1 minute (min)
60 minutes	= 1 hour (hr)
24 hours	= 1 day (da)
7 days	= 1 week (wk)
365 days	= 1 year (yr)
366 days	= 1 leap year
360 days	= 1 year for purpose of figuring simple interest
¼ hour	= 15 minutes
½ hour	= 30 minutes
¾ hour	= 45 minutes

Once again, when converting time measurements, *multiply* to get *more* of a smaller measurement, and *divide* to get *fewer* of a *larger* measurement.

ASSIGNMENT A:

1. How many minutes in 1½ hours?   _____

2. 360 minutes is equal to how many hours?   _____

3. James worked from: 6:00 to 12:00 on Monday
                     6:00 to 11:30 on Tuesday
                     6:00 to 1:00 on Wednesday
                     5:30 to 12:00 on Thursday
                     6:30 to 2:30 on Friday
How many hours did he work this week?   _____

4. Joan worked from: 9:00 to 5:00 on Monday
                     9:00 to 5:30 on Tuesday
                     9:30 to 5:00 on Wednesday
                     8:30 to 5:00 on Thursday
                     6:00 to 11:00 on Friday
How many hours did she work this week?   _____

13

5. What was your morning schedule in shop? Indicate what activities you were involved in and how long they lasted.

6. Select 3 different recipes and figure out about how long it would take to prepare them.

7. Calculate how long it would take to wash dishes for 100 people; for 200 people; for 500 people. Figure this out for a typical meat lunch.

TIMING MEAT COOKING:

Instructions for roasting are sometimes given as *minutes per pound* of meat at a given temperature.

Example: At 20 minutes roasting time per pound of beef, how much oven time will be needed for a 5½ lb. roast?

Method 1: Using decimals.

Change the 5½ to 5.5 minutes.

$$\begin{array}{r} 5.5 \\ \times\ 20 \\ \hline 110.0 \end{array}$$ minutes — or 1 hour and 50 minutes

Method 2: Using fractions.

5½ is changed to $\frac{11}{2}$

$\frac{11}{2} \times 20 = \frac{220}{2} = 110$ minutes

$= 1$ hour and 50 minutes

14

ASSIGNMENT B:

1. At 20 minutes roasting time per pound of beef, how much oven time will be needed for 4½ lb. roast?

_____ min or _____

2. 8 lb roast?

_____ min or _____

3. 6 lb. roast?

_____ min or _____

4. 7½ lb roast?

_____ min or _____

5. At 35 minutes per pound, how long will it take to roast a 6-pound pork cushion shoulder?

_____ min or _____

6. At 30 minutes per pound, how long will it take to roast a 14-pound fresh ham?

_____ min or _____

7. At 12 minutes per pound, how long will it take to roast a 22-pound standing beef rib roast?

_____ min or _____

15

Objective: You will learn the use of temperature in commercial foods

Related Information:

The standard unit for measuring temperature is the *degree*. A small circle to the upper right of the number is used to indicate the degree.

80°

The standard piece of equipment for measuring temperature is the thermometer. There are two main systems of measuring temperature, the Fahrenheit (English) or Celsius (or centigrade — metric). At present the most commonly used system in this country in restaurants is the English. Someday it will be metric.

Metric
Celsius

English
Fahrenheit

100° ——————   —— 212°   Water boils

                                 —— 98.6°   Normal temp.
                                            of blood

0° ——————   —— 32°   Water freezes

                                 —— 0°
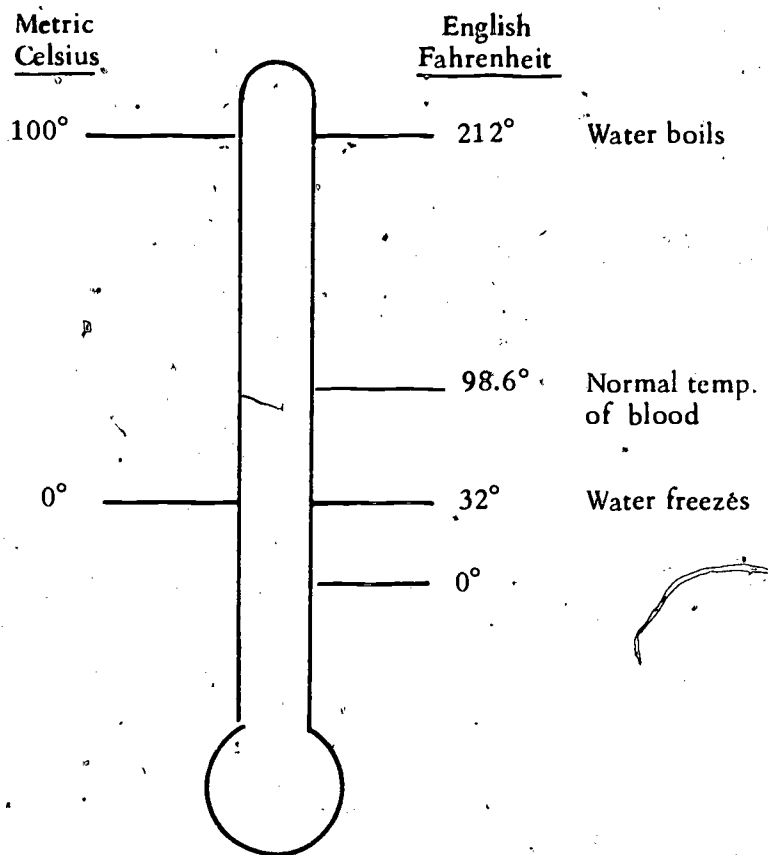
Just as with all metric systems, the Celsius is actually easier to use. Note above that the freezing point is 0°C., while it is 32°F in the English system. (Note that C or F is placed next to a temperature reading to indicate which system it is in.) The boiling point is 100°C or 212°F.

16

How to change from Celsius to Fahrenheit.

There is a formula for converting any temperature given in Celsius to Fahrenheit. It is

$$F = \frac{9}{5}C + 32$$

Example: Convert 50° Celsius to Fahrenheit.

$$F = \frac{9}{5} \times 50 + 32$$

$$F = \frac{450}{5} + 32$$

$$F = 90 + 32$$

$$F = 112°$$

How to change from Fahrenheit to Celsius.

The formula for changing from Fahrenheit to Celsius is

$$C = \frac{5}{9}(F - 32)$$

Example: What is the normal body temperature in degrees Celsius?

$$C = \frac{5}{9}(98.6 - 32)$$

$$C = \frac{5}{9}(66.6)$$

$$C = \frac{333}{9}$$

$$C = 37°$$

ASSIGNMENT

A. Change the following Celsius (Centigrade) temperatures to Fahrenheit:

1. 37° _____

2. 45° _____

3. 200° _____

4. 22° _____

5. 0° _____

17

B. Change the following Fahrenheit temperatures to Celsius (Centigrade):

1. 350°   _____

2. 32°   _____

3. 70°   _____

4. 21·2°   _____

5. 0°   _____

18

Objective: You will learn what "tolerance" means in recipes. You will learn to round
                off numbers.

Related Information:

       A scientist or engineer needs to have extremely accurate numbers in his work. In
the foods trades, however, great accuracy is not usually required.

       By tolerance we mean the *degree of accuracy* of any measurement — just how
exact the measurement has to be.

       At different times we need different degrees of accuracy. When it comes to the
manufacture of parts for a mixer or slicer, in order for the machine to operate smoothly
for many years the parts must be made very accurately. In making a macaroni-cheese
casserole, however, the measurements may be quite rough and the casserole will still taste
good.

       Experience plays an important part in applying tolerance in Commercial Foods.
Part of this experience is taste. Each restaurant and each cook has his or her or its own
method. Part of the learning process in shop is to gain the experience necessary to judge
tolerance, i.e., how far can I be off in whatever I am making and still produce a good
product.

Positive and negative tolerance

       Positive means we can be *over* a certain amount with little effect upon the
resulting product. *Negative* means we can be *under* a certain amount with little effect
upon the resulting product.

       If we added too much salt to a recipe we would be in trouble, because it would
be difficult to remove. Under such conditions it is better to play it safe and be either
very accurate or on the negative side. The customer can always add salt later on.

       A freezer or refrigerator could be too cold with little effect, but if it were too
warm, the food might be ruined. In this case negative tolerance is more desirable, positive
tolerance dangerous.

       In heating substances, we should also tend to favor the negative side, since we
can always heat the substance longer; but if our oven were too hot we could burn the
food.

19

Rounding Off

Under some circumstances we need to be very accurate. In most cooking, however, this is neither practical nor desirable. We need to know our tolerance, or the amount we can vary without damaging results.

"Rounding off" means being practical in mathematics. If a recipe called for five pounds of potatoes and we had a quarter of a pound extra, we certainly would not want to throw out the extra potato. If the teacher asked us if we had five pounds, we would not state that we had 5.250 pounds, but we would round the amount off and indicate that we had five pounds.

In dealing with many of the math problems in this book, *it is not necessary to keep all the numbers that result from a calculation.*

$$\begin{array}{r} \text{Example:} \quad 2.54 \\ \times\ 2.3 \\ \hline 762 \\ 508 \\ \hline 5.842 \end{array}$$

Do we need the accuracy called for in the answer above?

That depends on *what our tolerance is.*

If tolerance is permitted (i.e., we do not need that great an accuracy), we should learn to round off the numbers as much as possible.

Since we may have a different tolerance for each substance we are working with, we must know the tolerance before we can decide how far to round off. Shall it be

5.842 ? or 5.84 ? or 5.8 ? or 6 ?

We will assume for the following problems that you *know the tolerance.* We shall only be concerned with *how* to round off numbers.

Rule 1: To round off any number to a specific place, observe the digit to the *right* of the digit in that place. If it is *less than 5*, leave the digit in the desired place exactly as it is and replace all digits to the right of it with zeros. (If you are working to the right of a decimal point, do not replace the digits with zeros, but simply drop them.)

Example: To round off 32 to the nearest group of tens: The digit in the tens place is 3. The digit *to the right of it* is 2, which is *less than 5*. Therefore we leave the 3 as it is and replace the 2 with a zero. The rounded-off number is therefore 30.

29

30 – 31 – 32 – 33 – 34 – 35 – 36 – 37 – 38 – 39 – 40
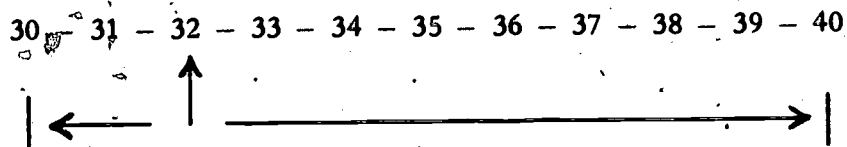
As you can see from the chart shown here, the 32 is closer to 30 than it is to 40.

Rule 2: If the digit to the right of the desired place is *5 or greater than 5*, increase the digit in the desired place to the *next higher* digit and replace all following digits to the right of it with zero. (If you are working to the right of a decimal point, drop the digits rather than replacing them with zeros.)

Example: To round off 5.842 pounds to the nearest pound: The 8 in the tenths column is *greater than 5*; therefore we increase the 5 to 6. Since the digits to be dropped are to the right of the decimal point, we do not replace them with zeros. Our answer is 6 pounds.

PRE-ASSIGNMENT:

Answer

1. Round off to the nearest ten: 81 _____

2. Round off to the nearest ten: 17 _____

3. Round off to the nearest ten: 85 _____

4. Round off to the nearest thousand: 12,847 _____

5. Round off to the nearest pound: 10.2 pounds _____

6. Round off the nearest quart: 5.75 quarts _____

7. Round off to the nearest hundred: 298 _____

8. Round off to the nearest cent: $10.675 _____

ASSIGNMENT

A. Round off the following to the nearest ten:

1. 39 _____   6. 52 _____

2. 25 _____   7. 683 _____

3. 40 _____   8. 88 _____

4. 136 _____   9. 109 _____

5. 451 _____   10. 498 _____

21

B. Round off to the nearest hundred:

1. 135 _____   6. 1,480 _____
2. 647 _____   7. 32,049 _____
3. 276 _____   8. 133.9 _____
4. 355 _____   9. 248.2 _____
5. 2975 _____   10. 992.7 _____

C. Round off to the nearest cent:

1. $.267 _____   8. $.834 _____
2. $.594 _____   9. $14.9615 _____
3. $1.316 _____   10. $30.2137 _____
4. $5.8682 _____   11. $.62½ _____
5. $24.6754 _____   12. $1.57¼ _____
6. $.643 _____   13. $.28½ _____
7. $6.572 _____   14. $39.78¼ _____

D. Round off to the nearest tenth:

1. .25 _____   6. .14 _____
2. .87 _____   7. .32 _____
3. .984 _____   8. 1.83 _____
4. 4.16 _____   9. 3.718 _____
5. 5.205 _____   10. 2.39 _____

E. Round off to the nearest hundredth:

1. .517 _____   6. .320 _____
2. .308 _____   7. .934 _____
3. 5.845 _____   8. 6.544 _____
4. 9.3794 _____   9. 8.3025 _____
5. 15.2963 _____   10. 14.9962 _____

F. Round off to the nearest whole number:

1. 6.3 _____   6. 9.6 _____
2. 19.4 _____   7. 68.5 _____
3. 2.09 _____   8. 100.81 _____
4. 34.28 _____   9. 25.989 _____
5. 868.126 _____   10. 399.704 _____

31

22

Objective: At the end of this lesson you should have some idea of size number and the quantity of food in the different size containers.

Related Information:

Can and jar sizes go by numbers, as follows:

Container Size	Capacity	Approximate Weight of Contents	Uses
8-ounce can or jar	1 cup	8 ounces	Called 8-oz or buffet size. Used for fruits, vegetables, and specialties.
Picnic can	1¼ c	10½ to 12 ounces	Used for condensed soups, some fruits, vegetables, meat and fish products, and specialties.
12-ounce can	1½ c	12 ounces	Used largely for vacuum-packed corn.
No. 300 can	1¾ c	14 to 16 oz	Commonly called the "1-pound" can. Pork and beans, baked beans, meat products, specialties.
No. 303 can, jar	2 c	16 to 17 oz	Often called the 16- or 17-oz can or jar. Fruits, vegetables, meats, ready-to-serve soups, and specialties.
No. 2 can	2½ c (20 fl. oz)	20 oz	Juices, ready-to-serve soups, pineapple, apple slices, some specialties.
No. 2½ can, jar	3½ c	27 to 29 oz	Fruits, some vegetables (pumpkin, sauerkraut, spinach and other greens, tomatoes).
No. 5 can	1 qt	3 lbs	Fruit juices, chopped clams, and soups.
46-ounce can	5¾ c (46 fl. oz)	51 oz	Fruit and fruit juices, whole chicken, pork and beans, condensed soup.
No. 10 can	3 qts	6½ to 7¼ lbs	Restaurant and institutional size. Fruits, vegetables, entrees.

23

Additional information: No. 2 can comes 24 to the case.

No. 2½ can comes 24 to the case.

No. 5 can comes 12 to the case.

No. 10 can comes 6 to the case.

ASSIGNMENT:

1. What is the most commonly used can size in restaurants and institutions? _____

2. What can size is approximately half the size of the No. 10? _____

3. How many No. 10 cans are there in a case? _____

4. How many cups are in a No. 10 can? _____

5. What is the difference in number of cups between No. 303 can and a No. 2 can?

_____

6. What sizes of cans are commonly used for fruit juices? _____

7. Sauerkraut often comes packed in _____ can size.

8. Does the No. 2½ can contain 2½ cups? _____ If not, how many cups? _____

9. How many No. 2 cans are usually packed in a case? _____

10. You need 12 ounces of corn; what size can would you select? _____

24

Objective: You will learn how to use a portion-control chart.

Related Information:

Determining what to charge a customer and doing it accurately enough to make certain of a profit is not difficult, but it does require the gathering of certain facts.

In order to set prices. the restaurant owner uses *standard recipes.* This gives control over the.type of materials and the quantities going into any one serving.

It is one thing to prepare. a large batch of soup, but if we use the wrong size bowl to serve it, we may wind up *short* as a result of serving too much, or *over* if we use too small a container. To prevent this, *portion control* must be exercised.

Portion control means giving out of food in quantities that are accurate, or *controlled.*

By having small containers (paper or plastic cups) prepared ahead of time with juice, syrup, catsup, mustard, etc. time is saved on the food-serving line, and less waste results.

The following chart and exercise will give you some practice in the use of charts and will also provide information necessary for determining costs:

PORTIONING CHARTS

Vegetables

(1) Product	(2) Size	(3) Yield	(4) No. of Servings	(5) Weight or Count of Portion	(6) Cup No.
Beans, lima	No. 10	72 oz.	28	2½ oz.	400
Beets, Harvard	No. 10	80 oz.	20	4 oz.	400
Carrots	No. 10	72 oz.	28	2½ oz.	400
Cauliflower, fresh	Head	2½ lb.	10	4 oz	—
Corn, creamed	No. 10	96 oz.	24	4 oz.	400
Corn, kernels	No. 10	72 oz.	24	3 oz.	400
Peas	No. 10	72 oz.	24	3 oz.	400

_25

Fruit Desserts

(1) Product	(2) Size	(3) Yield	(4) No. of Servings	(5) Weight or Count of Portion	(6) Cup No.
Apricots	No. 10	86 pc.	17	5 pc.	550
Cherries	No. 10	300 pcs.	43	7 pc.	550
Peach halves	No. 10	38 pc.	19	2 pc.	550
Plum halves	No. 10	38 pc.	13	3 pc.	550
Peaches, sliced	No. 10	106 oz.	21	5 oz.	550
Prunes, stewed	No. 10	112 oz.	28	6 pc.	550
Strawberries, fresh	Qt.	20 oz.	7	3 oz.	550

Reading the Chart:

1. Column 1 gives the name of the product.
2. Column 2 indicates the probable size of the can that you will have on the shelf.
3. Column 3 indicates the weight of the particular item.
4. Column 4 indicates the number of servings from a can or container.
5. Column 5 indicates the amount in each serving — weight or number of pieces.
6. Column 6 indicates the size of paper container suggested for that product.

Example:

Peaches, sliced	No. 10	106 oz.	21	5 oz.	550

Note: Peach halves are easy to measure, but slices are not. Therefore for peach halves we might call for two, but for slices, weight or capacity must be used.

1. What size container do the peaches usually come in? __#10__

2. What is the usual weight of the contents of the can? __106 oz__

3. How many servings can you get from one can, assuming 5 oz. per serving? __21__

4. What size paper cup is suggested? __#550__

There is a standard code system adopted by the paper-container industry.
A No. 400 cup holds 4 fluid ounces of liquid.
A No. 550 cup holds 5½ fluid ounces of liquid.
A No. 100 cup holds 1 fluid ounce of liquid.
A No. 075 cup holds ¾ fluid ounce of liquid.
A No. 050 cup holds ½ fluid ounce of liquid.

5. How many fluid ounces of peach slices would be a serving? __5½__

26

ASSIGNMENT A:

1. How many servings of peach halves can we get from a No. 10 can? _____

2. How many peach halves go into a standard portion of peaches? _____

3. Strawberries are usually purchased by the _____

4. What size cup would you use for stewed prunes? _____

5. How many apricots (canned) are in a standard portion? _____

6. How many servings can be made from a No. 10 can of corn kernels? _____

7. How many ounces of canned peas equals a standard portion? _____

8. What size cup would you use for canned Harvard beets? _____

9. How many ounces of carrots to a standard serving? _____

10. How many servings can we get from a 2½-lb head of cauliflower? _____

How would we figure out the cost per serving of peach halves?

1. Looking on the chart, we find we use 2 peach halves to a standard portion.
2. We find that there are 19 servings in a number 10 can.
3. We look up the price of the No. 10 can of peaches......... Let's say our chart shows 6 No. 10 cans of peaches (a case) cost $10.74.

$$6 \overline{)10.74} \qquad = \$ 1.79 \text{ per \# 10 can}$$

4. How much does each serving cost?

19 servings in a # 10 can

$$19 \overline{)1.79} \qquad = \$ .094$$

$ .09 per serving (rounded off)

ASSIGNMENT B:

Find the cost of an individual serving of:

1. Creamed corn. Cost per case of #10 cans is $6.38.

2. Apricots. Cost per case of #10 cans is $11.44.

3. Fresh strawberries. Cost per quart is $ .89.

Objective: You will gain skill in working with denominate numbers.

Related Information:

The numbers we have been working with in the previous lessons involve some type of measurement, such as ounces, pounds, minutes, and degrees, to name a few. Numbers like 7 feet, 6 pounds, 20 minutes, etc., are called *denominate* numbers because they stand for specific measurements. They have "names." "Abstract" or "pure" numbers have no description after them.

> 6 feet .... a denominate number
> 6 .... a pure number

In the foods trade, when we must multiply or divide numbers, we find both types in the same problem. For example, as in the previous lesson, suppose we wanted to figure out how many 4-ounce portions we could get out of 2 pounds of fruit salad. Two pounds can be changed to 32 ounces. We divide a denominate number by a denominate number: –

$$\frac{32 \text{ ounces}}{4 \text{ ounces}} = 8$$

Here 8 is a pure number. It is just a count of 8 items. In this case we will call it 8 portions, but it is really just a plain number.

Suppose we want to double a recipe. We multiply the amount of each ingredient by 2. By 2 *what?* By the *number 2,* that's what.

> 3 cups of sugar X 2

We multiply a denominate number, *3 cups,* by the pure number 2, and we end up with the denominate number *6 cups.*

In doing measurement problems, you will often have to change from a small unit to a larger unit.

> How many inches in 1½ feet?
>
> Analysis: An inch is a small unit; a foot is a larger unit.
>
> We must change from feet (larger) to inches (smaller).
>
> There are 12" to the foot (" is the symbol for inch)
> (' is the symbol for foot)

28

RULE: To change from a larger unit to a smaller unit, *multiply*.

$$12''' \times 1\frac{1}{2} = 12 \times \frac{3}{2} = \frac{36}{2} = 18 \text{ inches}$$

To change from a small unit to a large unit:

Change 40″ to feet.

Analysis: An inch is a small unit; a foot a lárger unit,

There are 12″ to the foot.

RULE: To change from a smaller unit to a larger unit, *divide*.

$$\begin{array}{r} 3 \\ 12\overline{)40} \\ \underline{36} \\ 4/12 \text{ (or } 4'') \end{array}$$ Answer: 3 ft. 4 in.

When changing recipe quantities very often we must change from larger to smaller units or vice-versa.

PRE–ASSIGNMENT A:

1. 20 in = ___ ft ___ in
2. 2½ gal = ___ qt
3. 48 oz = ___ lb

ASSIGNMENT A:

1. 21 oz = ___ lb ___ oz
2. 5 pt = ___ qt ___ pt
3. 4 ft = ___ yd
4. 22 in = ___ ft ___ in
5. 4 hr 20 min = ___ min
6. 1½ gal = ___ qts
7. 3 qt = ___ pts
8. 10 pts = ___ qts
9. 9 articles = ___ doz
10. 6 qt = ___ gal

11. 2½ lb = ___ oz
12. 1½ gross = ___ doz
13. 12 fl oz = ___ c
14. 3 lb = ___ oz
15. 3 T = ___ t
16. 36 fl oz = ___ c
17. 100 min = ___ hr ___ min
18. 3½ doz = ___ pieces
19. 9 pt = ___ qt
20. 15 T = ___ oz

29

Adding Denominate Numbers:

When adding, subtracting or multiplying denominate numbers it is usually the practice to put the answer in the simplest form as, for example

11 ft 16 in should be changed to: 12 ft 4 in

PRE-ASSIGNMENT B:

Add these units and simplify..

1. 1 ft   7 in
    4 ft   8 in

ASSIGNMENT B:

1.	5 yd 2 ft.	2.	3 gal 2 qt	3.	5 hr. 30 min	4.	6 lb 9 oz	5.	2 qt 1 pt
	2 yd 2 ft		2 gal 3 qt		2 hr. 45 min		5 lb 8 oz		3 qt 1 pt

6.	2 hr 40 min	7.	6 gal 2 qt	8.	12 lb 8 oz	9.	2 qt. 1 pt	10.	7 hr 48 min
	1 hr 20 min		1 gal 3 qt		4 lb 9 oz		3 qt 1 pt		9 hr 32 min
							2 qt 1 pt		

Subtracting Denominate Numbers:

In subtracting denominate numbers, we sometimes have to subtract a large number from a smaller one. In such a case we need to *borrow*, as this example shows:

Subtract: 6 feet   2 inches
           − 4 feet   6 inches

We cannot subtract 6 inches from 2 inches, so we borrow *one of the 6 feet*, call it *12 inches*, and *add it to the 2 inches*, making 14.

$$\overset{5}{\cancel{6}} \text{ feet } \overset{14}{\cancel{2}} \text{ inches}$$
$$- \ \ 4 \text{ feet } \ \ 6 \text{ inches}$$
$$\ \ \ \ 1 \text{ foot } \ \ 8 \text{ inches} \quad \text{Answer}$$

30

ASSIGNMENT C:

1. 12 lbs 4 oz	2. 18 lbs 9 oz	3. 21 lbs 10 oz
− 6 lbs 2 oz	−11 lbs 4 oz	− 7 lbs 10 oz

4. 13 lbs 1 oz	5. 6 qts 2 pts	6. 18 qts
− 5 lbs 3 oz	− 2 qts	− 7 qts 1 pt

7. 5 gal 3 qts	8. 9 gal 1 qt	9. 6 yds
−1 gal 2 qts	−2 gal 3 qts	−1 yd 1 ft

10. 18 yds	11. 5 ft. 9 in	12. 14 ft 10 inches
− 7 yds 2 ft	−1 ft 7 in	− 5 ft 11 inches

13. 4 hrs 30 min	14. 17 hrs 45 min	15. 12 hrs 7 min
−2 hrs 15 min	− 6 hrs 50 min	− 4 hrs 22 min

Multiplication of Denominate Numbers

PRE−ASSIGNMENT D:

Multiply and reduce to simplest form.

1. 2 ft. 7 in
   X 5

ASSIGNMENT D:

Multiply and reduce to simplest form.

1.   3 qt 1 pt
         X 4

2. 1 hr 30 min
          X 7

Ans._____

3.   5 gal 2 qt
          X 3

4. 5 lb 9 oz
          X 4

40

31

5.　1 qt. 1 pt
　　　　　× 2
　　　　_____

6.　3 lb 8 oz
　　　　　× 5
　　　　_____

7.　12 gal 3 qt
　　　　　× 4
　　　　_____

8.　2 hr 16 min
　　　　　× 6
　　　　_____

41

Objective: You will review the meaning of fractions.

Related Information:

Fractions are frequently used in our daily affairs. In the store we may buy a quarter-pound of cheese, ½ dozen eggs, or 2½ pounds of vegetables. We are familiar with the expression "one-half off" when referring to sale merchandise.

A *fraction* is something that is *less than a whole thing.*

½ lb of rice is less than a whole pound.

¼ pound of cheese is less than a whole pound of cheese.

¾ yard of material is less than a whole yard of material.

A fraction is composed of two parts.

    a.   The number *below the line* (or to the right of the line) shows how many parts the whole thing has been divided into.

        The number below the line is called the *denominator.*

        In the fraction ½, the number below the line is 2.

        It means the whole thing has been divided into two equal parts.

        In the fraction 1/12, the 12 means the whole thing has been divided into 12 equal parts.

        Example: A dozen eggs can be considered one whole thing, divided into 12 separate eggs.

    b.   The number *above the line* (or to the left of the line) in a fraction shows how many of those parts have been taken or used.

        The number above the line is called the *numerator.*

            1/2   You want 1 out of the 2 parts .
            1/12   You want 1 out of the 12 parts.

        You want 1/4 lb: the whole pound is considered to be divided into four equal parts, and you want 1 of them.

        You want 3/4 lb: The whole pound is divided into four equal parts and you want 3 of them.

Again: The denominator tells how many equal parts the whole has been divided into.

        The numerator tells how many of the parts you are talking about.

42

What you do with the numerator depends on the problem.

Additional example:

The fraction 1/8 is less than 3/8.
In 1/8 you are talking about only 1 part out of 8.
In 3/8 you are talking about 3 parts out of 8.

ASSIGNMENT:

1. We can divide a pound into *two* halves (1/2) + (1/2).
    The denominator tells us how many parts we are dividing the item into.

    Into how many thirds can you divide a pie?   _____

    Into how many quarters can you divide a pound of butter?   _____

    Into how many eighths can you divide something?   _____

    Into how many twelfths can you divide something?   _____

2. In the fraction 2/3, we mean *two* out of *three* parts
    What do we mean when we see:

    1/3 _____   5/8   _____

    1/5 _____   5/12 _____

    4/5 _____   7/8   _____

3. Name the denominator in the following fractions:

    5/16 _____   7/64 _____   9/16 _____

    1/32 _____   3/8   _____   1/12 _____

4. Name the numerators:

    5/16 _____   7/64 _____   9/16 _____

    1/32 _____   3/8   _____   1/12 _____

5. Take a nickel out of your pocket and draw eight circles.
    Shade the portion indicated by the following fractions:

    1/2, 1/4, 1/8, 3/8, 3/4, 7/8, 3/16, 5/16

43

34

6. Write the following expressions as fractions:

One egg out of a dozen _____

Six eggs out of a dozen _____

One quarter out of a dollar _____

One cent out of a dollar _____

Three minutes out of one hour _____

Three ounces out of one pound _____

One quart out of a gallon _____

One cup out of a pint _____

Three cans out of a case of twelve cans _____

Thirty cents out of a dollar _____

7. Put the following groups of fractions in proper order, from smallest to largest:

a. 3/4, 1/4 _____

b. 7/8, 3/8, 1/8, 5/8, _____

c. 5/16, 3/16, 7/16, 9/16 _____

Lesson 2 _____ Types of Fractions

Objective: You will learn the different types of fractions.

Related Information:

There are *three* different types of fractions:

The proper fraction (common).

Example: $\frac{1}{4}$ In the proper fraction the numerator is smaller than the de-nominator.

The proper fraction is always less than one whole thing.

The improper fraction.

Example: $\frac{4}{3}$ In the improper fraction the numerator is generally larger than the denominator.

Example: $\frac{4}{4}$ Sometimes the numerator is equal to the denominator.

The value of an improper fraction can be 1 or more than 1.

The mixed number.

Example: $2\frac{1}{4}$ The mixed number contains a whole number (2) plus a proper fraction (1/4).

When giving the answer to a problem, an improper fraction is usually changed to a mixed number.

A mixed number is often changed into an improper fraction to make the solving of certain fraction problems easier.

How to change an improper fraction to a whole number or mixed number:

$\frac{8}{4}$ Divide the denominator into the numerator:

4 into 8 = 2   (Answer)

$\frac{8}{7}$ Divide 7 into 8 = $1\frac{1}{7}$ (Answer)

How to change mixed numbers into improper fractions:

$1\frac{3}{4}$ Multiply the 1 times the 4 (whole number X denominator) (=4); then add the numerator (3) = 7

Place the 7 over the denominator of the fraction part: $\frac{7}{4}$ (Ans.)

Example: $5\frac{3}{8}$ 5 X 8 = 40 + 3 = 43, over 8 = $\frac{43}{8}$.

45

Just as a check, change the 43/8 back to a mixed number:

$$\frac{43}{8} = 8)\overline{\begin{array}{r}5 \\ 43 \\ 40 \\ \hline 3\end{array}} = 5\frac{3}{8} \quad \text{(Back to where we started.)}$$

ASSIGNMENT:

1. Tell which of the following are proper fractions, improper fractions, and mixed numbers.

   a. $3\frac{1}{3}$ _____   e. $7\frac{1}{8}$ _____

   b. $\frac{1}{12}$ _____   f. $\frac{5}{2}$ _____

   c. $\frac{3}{2}$ _____   g. $4\frac{1}{7}$ _____

   d. $\frac{5}{6}$ _____   h. $\frac{3}{10}$ _____

2. Change the following mixed numbers to improper fractions:

   a. $1\frac{1}{2}$ c. $5\frac{3}{4}$ e. $12\frac{3}{8}$ g. $8\frac{7}{8}$

   b. $1\frac{1}{3}$ d. $7\frac{1}{5}$ f. $5\frac{5}{16}$ h. $4\frac{2}{3}$

3. Change the following improper fractions to mixed numbers

   a. $\frac{8}{3}$ d. $\frac{41}{10}$ g. $\frac{35}{4}$ i. $\frac{72}{16}$

   b. $\frac{24}{9}$ e. $\frac{23}{4}$ h. $\frac{19}{8}$ j. $\frac{25}{5}$

   c. $\frac{33}{4}$ f. $\frac{21}{2}$

4. How many pies do I need for 7 quarters?

5. Change the following to improper fractions:

   a. $2\frac{1}{2}$ e. $2\frac{3}{4}$ i. $3\frac{1}{4}$ m. $2\frac{3}{8}$

   b. $5\frac{1}{4}$ f. $4\frac{1}{8}$ j. $6\frac{1}{2}$ n. $7\frac{1}{3}$

   c. $5\frac{3}{8}$ g. $6\frac{3}{5}$ k. $7\frac{3}{4}$ o. $3\frac{5}{16}$

   d. $6\frac{3}{10}$ h. $2\frac{3}{16}$ l. $9\frac{2}{3}$ p. $10\frac{3}{8}$

6. Change to a mixed number or whole number:

   a. $\frac{14}{3}$ e. $\frac{17}{6}$ i. $\frac{32}{4}$ m. $\frac{85}{10}$

   b. $\frac{33}{4}$ f. $\frac{20}{10}$ j. $\frac{25}{6}$ n. $\frac{48}{16}$

   c. $\frac{18}{12}$ g. $\frac{18}{5}$ k. $\frac{28}{3}$ o. $\frac{1000}{2}$

   d. $\frac{7}{4}$ h. $\frac{27}{12}$ l. $\frac{46}{8}$ p. $\frac{202}{5}$

46

Lesson 3   Reducing Fractions to Lowest Terms

Objective: You will be able to reduce fractions to lowest terms.

Related Information:

It is common practice to reduce fractions to lowest terms and use them in that form. If we need 8 ounces of flour, we would ask for 1/2 pound, not 8/16 of a pound. If something took 30 minutes, we would say 1/2 hour rather than 30/60 of an hour.

When we reduce fractions to lowest terms, *we do not in any way change the value of the fraction.* The fraction 2/4 has the same value as the fraction 1/2.

Fractions that look different but have the same value are called *equivalent* fractions. When finding answers to problems, unless otherwise stated you must reduce answers to fractions in their lowest terms.

Some students have trouble reducing fractions to lowest terms. Below are a few different procedures which may help you.

Procedure 1:

Reduce $\frac{4}{8}$ to lowest terms.

Look for a number that will divide evenly into both the numerator and the denominator. In some fractions, like the 4/8 above, *the numerator itself* will work as the divisor.

$$\frac{4}{8} \begin{array}{l} \Leftarrow \text{ divided by } 4 = 1 \\ \Leftarrow \text{ divided by } 4 = 2 \end{array} \quad \text{Answer is } \frac{1}{2}$$

Procedure 2:

Reduce $\frac{6}{9}$ to lowest terms.

If the numerator will not divide evenly into the denominator, look for *a smaller number* that will divide evenly into both the numerator and the denominator.

In this case the numerator 6 will not divide evenly into the denominator. We then look for a divisor that will divide evenly into both numerator and denominator. Try the small numbers like 2, 3, 4, 5, 6, etc.

In this case, 2 does not work, because it will not divide evenly into 9. Try 3 next. Good – 3 will go evenly into both.

$$\frac{6}{9} \begin{array}{l} \Leftarrow \text{ divided by } 3 = 2 \\ \Leftarrow \text{ divided by } 3 = 3 \end{array} \quad \text{Answer is } \frac{2}{3}$$

38

Procedure 3:

Reduce $\frac{100}{1000}$

In cases where there are zeros ending both the numerator and denominator, we can divide by 10 or 100, depending on the fraction. A shortcut is to cross out the zeros. *You can cross out an ending zero in the numerator for every such zero in the denominator.* This is the same as dividing by ten.

$$\frac{1\cancel{00}}{10\cancel{00}} = \frac{1}{10}$$

Procedure 4:

Reduce $\frac{26}{39}$

In the problem above, many students will decide that the fraction is in its lowest terms and cannot be reduced. It is true that there are many fractions that cannot be reduced. Examples are:

$$\frac{5}{9}, \quad \frac{17}{23}, \quad \frac{6}{11}, \quad \frac{7}{19}, \text{ etc.}$$

However, before making the statement that a fraction cannot be reduced, try procedure 4. Divide the numerator by a low number such as 2 or 3. *This may provide you with a divisor* that will divide evenly into both numerator and denominator.

$\frac{26}{39} \Leftarrow$ divided by 2 = 13 $\frac{26}{39} \Leftarrow$ divided by 13 = 2   divided by 13 = 3   **Answer** $\frac{2}{3}$

Summary: Reduce fractions to lowest terms where possible. Use whatever procedure is easiest for you. Two or more steps may be necessary in some cases.

ASSIGNMENT:

1. Reduce the following fractions to lowest terms:

   a. $\frac{2}{6}$ d. $\frac{9}{36}$ g. $\frac{24}{48}$

   b. $\frac{5}{10}$ e. $\frac{4}{12}$ h. $\frac{25}{125}$

   c. $\frac{9}{18}$ f. $\frac{3}{27}$ i. $\frac{60}{360}$

2. Reduce the following fractions to lowest terms:

   a. $\frac{15}{20}$ d. $\frac{10}{50}$ g. $\frac{45}{60}$

   b. $\frac{9}{12}$ e. $\frac{16}{32}$ h. $\frac{10}{25}$

   c. $\frac{25}{35}$ f. $\frac{12}{16}$ i. $\frac{4}{16}$

3. Reduce those fractions which are not in lowest terms:

a. $\frac{9}{10}$ d. $\frac{18}{81}$ g. $\frac{27}{54}$

b. $\frac{15}{21}$ e. $\frac{21}{25}$ h. $\frac{9}{15}$

c. $\frac{16}{21}$ f. $\frac{63}{72}$ i. $\frac{5}{16}$

4. Reduce the following fractions to lowest terms:

a. $\frac{30}{100}$ d. $\frac{15}{100}$ g. $\frac{1000}{2000}$

b. $\frac{75}{100}$ e. $\frac{125}{250}$ h. $\frac{190}{380}$

c. $\frac{125}{1000}$ f. $\frac{150}{350}$ i. $\frac{4500}{10000}$

5. Reduce the following fractions to lowest terms:

6/12 of a dozen equals _____ dozen

4/16 pound of flour equals _____ pound

12/16 pound equals _____ pound

15/16 pound equals _____ pound

6. Making your own fractions:

The denominator represents the number of equal parts the whole has been divided into.

Example: A pie has been cut into 8 parts or slices.
Make the denominator 8.
The whole pie = 8/8
If you gave away 1 piece, you would give away 1/8.
You would have 7 pieces left, or 7/8.

In the problems below, after setting up each fraction, reduce it to lowest terms if possible.

a.   Three eggs out of a dozen   _____

b.   Eight ounces out of a pound   _____

c.   One spoon out of a dozen   _____

d.   Eight cups out of two dozen cups   _____

e.   Two parts out of a melon cut into four parts   _____

f.   One teaspoon out of a tablespoon   _____

g.   One cup out of a quart   _____

h.   Three quarts out of a gallon   _____

i.   Seven inches out of a foot   _____

j.   One No. 10 can out of a case of 6   _____

k.   Five portions out of a No. 10 can containing 25 portions   _____

l.   Three servings out of 25 servings prepared   _____

40

Lesson 4   Raising Fractions to Higher Terms

Objective: You will be able to raise fractions to higher terms.

Related Information:

In the previous lesson we practiced reducing fractions to lowest terms. We indicated that answers are usually given in lowest terms. But it is sometimes necessary to raise fractions to higher terms in order to do certain types of fraction problems. *This will not change the value of the fraction.*

Procedure: $\frac{1}{2}$ is to be changed to a fraction with a denominator of 10.

$\frac{1}{2} = \frac{?}{10}$ Divide 2 into 10 to find the multiplier.

$$2\overline{)10}^{\,5} \quad \text{5 is the multiplier.}$$

$\frac{1}{2} \times \frac{5}{5} \Rightarrow \frac{5}{10}$ Multiply both numerator and denominator by this number.

ASSIGNMENT:

1. Change the following fractions to equivalent fractions having the indicated denominators.

a. $\frac{1}{4}$ to 8ths   d. $\frac{5}{8}$ to 16ths   g. $\frac{3}{8}$ to 24ths

b. $\frac{1}{3}$ to 9ths   e. $\frac{1}{2}$ to 10ths   h. $\frac{1}{16}$ to 32nds

c. $\frac{1}{4}$ to 16ths   f. $\frac{4}{5}$ to 20ths   i. $\frac{1}{10}$ to 100ths

2. Change the following fractions to equivalent fractions having denominators as indicated:

a. $\frac{1}{2} = \frac{}{16}$ d. $\frac{7}{10} = \frac{}{100}$ g. $\frac{3}{4} = \frac{}{12}$

b. $\frac{2}{5} = \frac{}{10}$ e. $\frac{5}{7} = \frac{}{21}$ h. $\frac{1}{5} = \frac{}{20}$

c. $\frac{7}{8} = \frac{}{32}$ f. $\frac{2}{3} = \frac{}{12}$ i. $\frac{1}{3} = \frac{}{6}$

41

Lesson 5   Least Common Denominator

Objective: You will learn how to find the least common denominator.

Related Information:

Fractions that have the same denominator can be added or subtracted, depending upon what the problem calls for. When fractions have the same denominator, they are said to have a *common denominator*.

If they do not have the same denominator, then in order to add or subtract them, the fractions must be changed to equivalent fractions with a common denominator.

1/8   3/8   5/8   These fractions all have the same denominator. The common denominator is 8.

1/8   1/4   These fractions do not have the same denominator.

If we needed to add 1/8 and 1/4, the denominators would have to be made the same. We must find a number that both denominators will divide into evenly. Like reducing fractions, finding a common denominator is sometimes simple, but at other times more involved. The easiest type is illustrated above.

The *smallest* number that all denominators will divide into evenly is called the *least common denominator*.

1/8 and 1/4 Try the 4. The 8 will not divide into the four...... therefore it is not acceptable

Try the 8. The 4 will divide evenly into the 8, so it can be used as the least common denominator.

The above problem can be solved by procedure 1.

Procedure 1: When all the denominators will divide evenly into one of them, that one will be the least common denominator.

To get both fractions above into equivalent fractions having a denominator of 8:

$\frac{1}{8} = \frac{1}{8}$ (No problem here)

$\frac{1}{4} = \frac{?}{8}$ (We just learned how to do this — divide the 4 into the 8, getting 2. Multiply 2 × 1.)

$\frac{1}{4} = \frac{2}{8}$

51

We now have two fractions, 1/8 and 2/8, which are in a form where they can be added or subtracted.

Here is another example:

$$\frac{1}{5}, \quad \frac{2}{5}, \quad \text{and} \quad \frac{3}{10}$$

All denominators will divide evenly into 10, so 10 is the least common denominator.

$$\frac{1}{5} = \frac{2}{10}$$

$$\frac{2}{5} = \frac{4}{10}$$

$$\frac{3}{10} = \frac{3}{10}$$

Procedure 2: When one denominator will *not* divide evenly into the other, multiply one denominator by the other. For example,

$$\frac{1}{3} \text{ and } \frac{1}{4}$$

$$3 \times 4 = 12$$

Use 12 as the least common denominator.

$$\left. \begin{array}{l} \frac{1}{3} = \frac{4}{12} \\ \frac{1}{4} = \frac{3}{12} \end{array} \right\} \text{ (From the procedure you practiced in lesson 4.)}$$

We now have two fractions with the same denominator, and we can add them or subtract them.

$$\frac{4}{12} \text{ and } \frac{3}{12}$$

Procedure 3: Sometimes procedure 2 is difficult because the numbers are too large, or when there are three or more different denominators. For example,

$$\frac{3}{4} \text{ and } \frac{1}{8} \text{ and } \frac{2}{3}$$

Select the largest number. In this case it is 8.

See if the other denominators will divide evenly into this number. The 4 will, but the 3 will not. Reject the 8 and try 2 X 8 instead. 2 X 8 = 16.

Again try each denominator: 4 will divide evenly into 16.
                            8 obviously will.
                            3 will not. Reject 16.

52

Try 3 × 8 this time.

3 × 8 = 24

4 will divide evenly into 24.
8 will obviously divide evenly into 24
3 will divide evenly into 24.

Therefore 24 can be used as the *least common denominator*.

To complete the problem: $\frac{3}{4}$ and $\frac{1}{8}$ and $\frac{2}{3}$

become $\frac{18}{24}$ and $\frac{3}{24}$ and $\frac{16}{24}$ by the procedure of lesson 4.

Note: It is not always necessary to have the *least* common denominator. The numbers 48, 72, and 96 would all have worked in this case, but the end result would require reducing. So finding the actual *least* common denominator will give you smaller numbers to work with and will save extra work in the final operations – when adding or subtracting.

ASSIGNMENT

1. Find the least common denominator in the following problems:

   a. $\frac{5}{8}$ and $\frac{2}{3}$ _____   b. $\frac{1}{2}$ and $\frac{5}{6}$ _____   c. $\frac{1}{8}$ and $\frac{5}{16}$ _____

   d. $\frac{1}{4}$ and $\frac{1}{8}$ and $\frac{1}{2}$ _____   e. $\frac{4}{5}$ and $\frac{1}{4}$ and $\frac{2}{3}$ _____   f. $\frac{1}{3}$ and $\frac{1}{4}$ and $\frac{1}{6}$ _____

   g. $\frac{1}{5}$ and $\frac{1}{3}$ and $\frac{1}{6}$ and $\frac{1}{2}$ _____   h. $\frac{1}{2}$ and $\frac{1}{3}$ and $\frac{1}{4}$ and $\frac{1}{5}$ _____

   i. $\frac{9}{16}$ and $\frac{1}{4}$ and $\frac{1}{8}$ _____   j. $\frac{3}{64}$ and $\frac{5}{8}$ and $\frac{1}{4}$ _____

   k. $\frac{2}{3}$ and $\frac{7}{12}$ and $\frac{7}{16}$ _____   l. $\frac{5}{6}$ and $\frac{9}{10}$ and $\frac{1}{12}$ _____

Arranging fractions in order is sometimes difficult without first changing them to the same denominator. It is very obvious then which is the smallest, next etc.

2. Arrange the following fractions in order, from smallest to largest:

   a. $\frac{1}{8}$, $\frac{7}{8}$, $\frac{5}{8}$, $\frac{3}{8}$,

   b. $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$

53

c. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{16}$, $\frac{3}{8}$

d. $\frac{5}{16}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{8}$

e. $\frac{5}{8}$, $\frac{5}{32}$, $\frac{5}{16}$, $\frac{5}{4}$

f. $\frac{1}{5}$, $\frac{1}{15}$, $\frac{1}{20}$, $\frac{1}{10}$

g. $\frac{2}{3}$, $\frac{4}{5}$, $\frac{3}{4}$, $\frac{1}{2}$

h. $3\frac{1}{10}$, $3\frac{1}{4}$, $3\frac{1}{3}$, $3\frac{1}{8}$

3. Which is larger, 1/3 cup or 1/4 cup?

4. Which is larger, 2/3 cup or 3/4 cup?

54

Lesson 6   Addition of Fractions

Objectives: You will learn how to add fractions and mixed numbers.
               You will learn how addition of fractions is used in food service.

Related Information:

Fractions that have the same (common) denominator can be added immediately.

$$\frac{1}{8} + \frac{3}{8}$$ Example of fractions with a common denominator.

If the fractions do not have the same denominator:

$$\frac{1}{4} + \frac{3}{8}$$

You must follow the procedures outlined in the previous lesson and change them so they do have a common denominator.

$$\frac{1}{4} + \frac{3}{8} \text{ becomes } \frac{2}{8} + \frac{3}{8}$$

Procedure: Rules for adding fractions:

They must have a common denominator. If they do not, change them so they do have a common denominator. Then *add the numerators*, using the same denominator.

$$\frac{1}{8} + \frac{3}{8} = \frac{4}{8} \text{ Answer}$$

Note: Fractions can be added either horizontally or vertically. It is usually easier to add mixed numbers vertically.

$2\frac{3}{8}$ Add the fractions (if they have the same denominator)

$+ 5\frac{7}{8}$ Add the whole numbers. Reduce answer to lowest terms.

$7\frac{10}{8} = 7 + 1\frac{2}{8} = 8\frac{2}{8} = 8\frac{1}{4}$ Answer

Notice how you are combining many of the procedures learned in the last few sections. When you reduce $\frac{10}{8}$ it becomes 1 and $\frac{2}{8}$. The 1 is added to the 7, and the $\frac{2}{8}$ is reduced to $\frac{1}{4}$.

55

Add: $\frac{1}{4} + \frac{2}{3} + \frac{1}{8}$ Find the least common denominator. Change each fraction as described before.

$\frac{6}{24} + \frac{16}{24} + \frac{3}{24}$ Change each fraction as described before.

$= \frac{25}{24}$ Add numerators, placing the sum over the common denominator.

$= 1\frac{1}{24}$ Answer   Reduce improper fraction.

ASSIGNMENT:

(Reduce all answers to lowest terms)

1. $3\frac{1}{4}$
   $+9\frac{3}{4}$

2. $8\frac{3}{4}$
   $+ 4\frac{3}{4}$

3. $4\frac{1}{3}$
   $+ \frac{2}{3}$

4. $7\frac{1}{3}$
   $+ \frac{1}{2}$

5. $2\frac{1}{8}$
   $3\frac{3}{8}$
   $+ 11\frac{6}{8}$

6. $\frac{1}{4}$
   $+ \frac{9}{16}$

7. $2\frac{5}{6}$
   $+ 7\frac{1}{12}$

8. $10\frac{1}{4}$
   $6\frac{1}{8}$
   $+ 22\frac{3}{8}$

9. 4 1/4 + 5 1/2 + 6 5/8

10. 5 2/3 + 8 3/4

11. 1 1/2 + 5 1/16

12. 5 3/10 + 8

13. Joan worked part time as a waitress: Monday 3½ hours, Tuesday 3¼ hours, Wednesday 3¾ hours, Thursday 3¾ hours. How many hours did she work that week?

47

14. Pete worked the following hours. What was his total for the week? Sunday 8½, Monday 9, Tuesday 6½, Wednesday 8¾, Thursday 8, Friday 10¼.

_____

15. Sue worked the following hours. What was her total? Wednesday 7¼, Thursday 8¼, Friday 10½, Saturday 8¼, Sunday 6¾

_____

16. The following quantities of materials were used in the kitchen. Find the total of each to the nearest whole unit.

    a.   Flour: $2\frac{1}{8}$ c, $4\frac{1}{4}$ c, $1\frac{3}{4}$ c, $3\frac{1}{2}$ c

_____

    b.   Eggs: $\frac{1}{12}$ doz, $2\frac{3}{12}$ doz, $2\frac{1}{3}$ doz, $3\frac{1}{6}$ doz.

_____

    c.   Butter: $\frac{1}{4}$ lb, $2\frac{1}{8}$ lb, $3\frac{1}{16}$ lb, $1\frac{3}{4}$ lb.

_____

    d.   Milk: $1\frac{3}{4}$ qts, $4\frac{1}{4}$ qts, $5\frac{1}{8}$ qts, $3\frac{1}{2}$ qts.

_____

57

Objectives: You will learn how to subtract fractions and mixed numbers.
You will learn how subtraction of fractions can be used in food service.

Related Information:

Subtraction of fractions has similar rules to addition of fractions, namely, in order to subtract fractions the *denominators must be the same.*

If the denominators are not the same, change the fraction to an equivalent fraction containing the same common denominator.

It is advisable when subtracting fractions to place them vertically (one above the other).

A subtraction problem can be read in different ways:

$$\text{Subtract } \frac{1}{5} \text{ from } \frac{3}{5}$$

$$\text{or } \frac{3}{5} \text{ minus } \frac{1}{5}$$

$$\text{or } \frac{3}{5} - \frac{1}{5}$$

To complete the above problem, subtract the numerators. 1 from 3 equals 2. The answer is 2/5.

(Note that the denominator remains the same in the answer.)

Here is a different type of problem:

$\frac{7}{8} - \frac{1}{4}$ (Note that the denominators are not the same.)

Arrange vertically $\begin{array}{r} \frac{7}{8} \\ -\frac{1}{4} \\ \hline \end{array}$ Change to common denominator: $\begin{array}{r} \frac{7}{8} \\ -\frac{2}{8} \\ \hline \end{array}$

Then subtract: $\frac{5}{8}$

To subtract a fraction from a whole number:

$\begin{array}{r} 8 \\ -1\frac{5}{16} \\ \hline \end{array}$ Borrow 1 from the 8 and change it into a fraction. Since we are dealing with 16ths, the 1 becomes 16/16ths.

$\begin{array}{r} 7\frac{16}{16} \\ -1\frac{5}{16} \\ \hline 6\frac{11}{16} \end{array}$ Subtract the 5 from the 16, getting 11, to make the fraction part $\frac{11}{16}$.
Subtract the 1 from the 7, getting 6 for the whole-number part.

Answer

49

Borrowing in subtraction of fractions gives many students a difficult time.

$6\frac{1}{8}$

$-\frac{7}{8}$

When the numerator of the top fraction is smaller than the numerator of the bottom fraction (after changing both to the same denominator when necessary), then it is necessary to borrow.

You can only borrow from the whole number (6).

You borrow 1, making the 6 a 5.

Change the 1 into a fraction, using the common denominator.

$5\frac{8}{8} + \frac{1}{8}$

$-\frac{7}{8}$

Since we are working with 8ths, change the 1 to 8/8th.

$\frac{8}{8}$ plus $\frac{1}{8} = \frac{9}{8}$

$5\frac{9}{8}$

$-\frac{7}{8}$

7 from 9 = 2. Fraction part of answer is 2/8.

Whole-number part: nothing from 5 = 5.

$5\frac{2}{8}$

Reduce to $5\frac{1}{4}$ (Answer)

Another way to look at the process of borrowing:

Since you are borrowing 1 from 6, bring the 1 over to the fraction 1/8.

Now you have 5 and $1\frac{1}{8}$. The $1\frac{1}{8}$ is a mixed number; therefore change it to an improper fraction. It equals $\frac{9}{8}$.

After you have the 9/8, follow the same procedure as above to subtract.

ASSIGNMENT:
(Reduce all answers to lowest terms.)

1. Subtraction with the same denominators:

   a. 3/5 — 1/5   _____

   b. 7/8 — 3/8   _____

   c. 5/7 — 2/7   _____

   d. 3/4 — 1/4   _____

   e. 15/16 — 5/16   _____

50

f.   5/8 − 1/8   _____

g.   7/16 − 3/16   _____

h.   4 1/8 − 2   _____

i.   12 5/16 − 4 1/16   _____

j.   8 5/12 − 3 1/12   _____

2.   Subtraction with different denominators:

a.   5/8 minus 1/4   _____

b.   9/16 minus 3/8   _____

c.   3/4 minus 7/16   _____

d.   7/8 minus 1/2   _____

e.   1/2 minus 3/8   _____

f.   1 3/4 minus 5/8   _____

g.   8 6/8 minus 2 3/4   _____

h.   200 1/2 minus 45 1/8   _____

i.   24 7/8 minus 17 1/4   _____

j.   14 15/16 minus 2 3/8   _____

3.   Subtraction requiring borrowing:

a.   6 3/5 −1 4/5   _____

b.   4 1/4 − 2 3/4   _____

c.   12 1/2 − 4 3/4   _____

d.   18 1/4 − 6 1/2   _____

e.   2 1/8 − 5/16   _____

f.   8 1/4 − 4 2/3   _____

g.   11 1/3 − 2 1/4   _____

h.   12 1/16 − 3 5/16   _____

i.   340 1/8 − 245 1/2   _____

j.   36 1/2 − 18 5/8   _____

60

Word problems:

4. Four and one quarter pounds of vegetable fat were issued by the storeroom. Two and one-eighth pounds were used. What remained at the end of the meal?

_____

5. There were 2 2/3 dozen oranges in the refrigerator. The salad cook used 1 1/4 dozen. How many dozen were left?

_____

6. 25 1/4 lbs. potatoes minus 10 3/4 pounds.

_____

7. 7 gallons of milk minus 4 1/4 gallons.

_____

8. The cafeteria used 3 #10 cans of apricots last week. Each can weighed 6 1/2 lbs. What was the total number of pounds used?
If there were 5 #10 cans in the storeroom at the beginning of last week, how many pounds were left?

_____

_____

61

Lesson 8   **Multiplication of Fractions**

Objective: You will learn how to multiply fractions and mixed numbers.

Related Information:

In the previous two units we found that the rules for addition and subtraction of fractions were the same in that they both required *the same common denominator.* This is *not* true for multiplication of fractions. Multiplication, and division of fractions are closely related. *They do not require a common denominator.*

As a worker in the foods trades, you will often have to multiply fractions. You may need to change the amounts of the ingredients in a recipe so as to get, say, half as many portions, or three-fourths as many portions, or 1½ times the number, and so on. You may need to calculate time and a half to check up on your pay. You would be surprised at how often you will need to do this.

There are different combinations involved in multiplying fractions:

a. A fraction times a fraction: $\frac{1}{2} \times \frac{1}{2}$

b. A fraction times a whole number: $\frac{1}{4} \times 10$

c. A mixed number times a fraction: $3\frac{1}{2} \times \frac{7}{8}$

d. A mixed number times a mixed number: $2\frac{3}{4} \times 1\frac{5}{8}$

Procedure:

1. Fractions are easiest to multiply in the horizontal position (as shown above)

2. Prepare mixed numbers for multiplication by *changing mixed numbers to improper fractions.*

3. Place whole numbers over 1 to put them in fraction form. This does not change their value.

4. Multiply all numerators.

5. Multiply all denominators.

6. State all answers in lowest terms.

Multiplication may be indicated by: the symbol "X"

                                                 the word "times"

                                               the word "of"

62

Type A : Multiplying a fraction by a fraction.

$$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4} \Leftarrow \Leftarrow (1 \times 1 = 1) \\ \Leftarrow \Leftarrow (2 \times 2 = 4)$$

$$\frac{3}{8} \times \frac{1}{4} = \frac{3}{32} \Leftarrow \Leftarrow (3 \times 1 = 3) \\ \Leftarrow \Leftarrow (8 \times 4 = 32)$$

Type B: Multiplying a whole number by a fraction.

$\frac{1}{4} \times 10$ Place the 10 over 1: $\frac{1}{4} \times \frac{10}{1}$

$$\frac{1}{4} \times \frac{10}{1} = \frac{10}{4} \Leftarrow \Leftarrow (1 \times 10 = 10) \text{ Multiplying numerators} \\ \Leftarrow \Leftarrow (4 \times 1 = 4) \text{ Multiplying denominators}$$

$\frac{10}{4}$ is an improper fraction. Reduce it to lowest terms.

$= 2\frac{2}{4}$ which is further reduced to

$= 2\frac{1}{2}$

Type C: A mixed number times a fraction.

$3\frac{1}{2} \times \frac{7}{8}$ Change mixed number to improper fraction.

$$\frac{7}{2} \times \frac{7}{8} = \frac{49}{16} \Leftarrow \Leftarrow (7 \times 7 = 49) \\ \Leftarrow \Leftarrow (2 \times 8 = 16)$$

$$= 3\frac{1}{16}$$

Type D : A mixed number times a mixed number.

$2\frac{3}{4} \times 1\frac{5}{8}$ Change all mixed numbers to improper fractions.

$$\frac{11}{4} \times \frac{13}{8} = \frac{143}{32} \Leftarrow \Leftarrow (11 \times 13 = 143) \\ \Leftarrow \Leftarrow (4 \times 8 = 32)$$

$$= 4\frac{15}{32}$$

Note: When you multiply *any number* by a *proper* fraction, you will *always* end up with a *smaller number* than you started with! If you don't, then you have surely made an error. Go back over the problems above (types A, B, and C) and check this for yourself. Can you explain why this is so?

Additional information on procedure:

a.   You can multiply more than two fractions at a time.

$$\frac{1}{2} \times \frac{3}{5} \times \frac{2}{3} = \frac{6}{30} \Leftarrow \Leftarrow (1 \times 3 = 3, \ 3 \times 2 = 6) \\ \Leftarrow \Leftarrow (2 \times 5 = 10, \ 3 \times 10 = 30)$$

$$\frac{6}{30} = \frac{1}{5}$$ (Reduce   to lowest terms.)

b. Similarly, you can multiply two or more mixed or whole numbers or different combinations of them.

c. You can *cancel* to save time and make the multiplication easier.

You do not have to cancel. If you do not cancel, your answer will come out the same, but you will do a lot more work.

$\frac{10}{33} \times \frac{9}{25}$ Where the numbers in numerator and denominator have common factors, you can cancel them. (A factor of a number is a smaller number that will divide into the larger number evenly.)

In the above example, 10 in the numerator and 25 in the denominator have a common factor — 5. That is, 5 will divide evenly into both 10 and 25.

$\frac{\cancel{10}^{2}}{33} \times \frac{9}{\cancel{25}_{5}}$ There is another common factor:
3 will divide evenly into 33 and 9.

$\frac{\cancel{10}^{2}}{\cancel{33}_{11}} \times \frac{\cancel{9}^{3}}{\cancel{25}_{5}} = \frac{6}{55}$ $\Leftarrow \Leftarrow (2 \times 3 = 6)$
$\Leftarrow \Leftarrow (11 \times 5 = 55)$

You can also cancel where you have three or more fractions. Still follow the rule of dividing by a common factor in numerator and denominator. The original number can be canceled once, and the new amount canceled a second time. The problem gets shorter and easier with each cancellation.

ASSIGNMENT, Part A:

1. $\frac{9}{10} \times \frac{3}{4}$

2. $\frac{1}{5} \times \frac{1}{3}$

3. $\frac{3}{4} \times \frac{5}{8}$

4. $\frac{3}{4} \times \frac{8}{9}$

5. $\frac{1}{2} \times \frac{8}{15} \times \frac{5}{6}$

6. $7 \times \frac{1}{2}$

7. $48 \times \frac{3}{16}$

8. $6 \times \frac{5}{12}$

9. $8\frac{1}{3} \times \frac{3}{5}$

10. $2\frac{2}{5} \times 4\frac{2}{3}$

11. $1\frac{3}{4} \times 3\frac{1}{7} \times 1\frac{3}{5}$

12. $2\frac{1}{2} \times 2\frac{1}{2}$

13. $3\frac{1}{4} \times 1\frac{1}{2}$

14. $1\frac{1}{2} \times 1\frac{1}{3} \times 2$

15. $2\frac{2}{5} \times 10 \times \frac{1}{2}$

64

ASSIGNMENT, Part B:

1. ½ of 48	2. ½ of 32¢	3. ½ of $60
4. ¼ of 52¢	5. ¼ of 98	6. 2/5 of 45¢
7. 3/10 of $235	8. 5/8 of $158	9. 5/12 of $2,400
10. ½ of $1.80	11. ½ of $2.40	12. ½ of $3.20
13. 1½ times 12	14. 2½ times 16	15. 1¼ times 144

16. How many pieces in 5/6 of a dozen? _____

17. How many pieces in 3/4 of a gross? _____

18. How many ounces in 1/4 of a pound? _____

19. Find the cost of 1/2 dozen at $1.80 a dozen. _____

20. Find the total weight of 5 #10 cans weighing 6¾ pounds each. _____

56

Objectives: ·You will learn how multiplication of fractions is used in food service.

You will practice changing a recipe by means of multiplication of fractions.

Related Information:

A standard recipe is one that has been designed for a set number of portions, for example, 25 portions, 50 portions, or 100 portions. It is sometimes necessary to take a standard recipe and change it to serve more, or fewer, people.

If we had a standard recipe that served 25 people and we wished to make 50 portions, we would simply multiply each quantity by 2. Another example:

6 lbs onions (for 25 portions) to 100 portions

25 divides into 100 four times......therefore multiply the quantity by 4.

4 X 6 lbs of onions = 24 lbs of onions for 100 portions

In some cases we may wish to *make the portions smaller.* Fractions can be useful in this situation. Our standard (for example) may serve 50 people, and we wish to make only 25 portions:

$\dfrac{25 \text{ (portions) desired}}{50 \text{ (portions) standard}}$ Reduce the fraction to $\frac{1}{2}$

Take ½ of each quantity. We could also use simple division and divide each quantity by 2.

Example 2: Standard recipe: 50 portions; we want 10 portions.

$\dfrac{10 \text{ (desired)}}{50 \text{ (standard}} = \frac{1}{5}$ Therefore take $\frac{1}{5}$ of each quantity.

$\frac{1}{5}$ X 6 lbs $= \frac{1}{5} \times \frac{6}{1} = \frac{6}{5} = 1\frac{1}{5}$ lbs

What is $\frac{1}{5}$ of a lb? Hint: $\frac{1}{5}$ of 16 oz.

Full final answer is 1 lb and 3 oz (approximately)

66

ASSIGNMENT:

1. ½ of 4 oz of butter: _____

2. ¼ of 2 gallons of milk is _____ gallons or _____ quarts.

3. ¾ of 3 gallons of clams is _____ gallons or _____ quarts.

4. $\frac{1}{3}$ of 6 lbs of potatoes: _____

5. ¼ of 8 oz of tomato puree: _____

6. Your recipe serves 50 people; you wish to feed 25. Set up a fraction in lowest terms to represent the quantity you need.   _____

7. Your recipe serves 100 people; you wish to feed 25. Set up a fraction that you can use to multiply each quantity in the original recipe.   _____

8. Your recipe serves 100 people; you wish to feed 30. Set up the proper fraction to use to multiply each quantity.   _____

9. Change the following recipe to 12 portions. (Hint – use a reasonable approximation.)

Baked stuffed pork chops.   Yield: 50 portions

Ingredients	Standard	12 portions
Pork chops, 6 oz.	50	_____
Basic bread stuffing	2½ qts	_____
Whole-kernel corn	1 lb	_____
Brown sauce	1 gal	_____

10. Change the following recipe to 30 portions. (Give realistic amounts.)

Ham croquette mixture   Yield: 50 portions

Ingredients	Standard	30 portions
Celery, minced	1 lb	_____
Onions, minced	1 lb	_____
Green pepper, minced	1 lb	_____
Butter or shortening	1½ lb	_____
Bread flour	1½ lb	_____
Hot milk	2 qts	_____
Prepared mustard	¼ cup	_____
Dry mustard	2 T	_____
Cooked chopped ham	8 lbs	_____
Parsley, chopped	1 cup	_____

67

11. Change the following recipe to 40 portions. (Give realistic amounts.)

Lamb a l'Indienne.   Yield: 50 portions

Ingredients	Standard	40 portions
Lamb, boneless and cubed	17 lb	_____
Water	2 gal.	_____
Salt	2 oz	_____
Butter	1 lb	_____
Curry powder	4 t	_____
Flour	8 oz	_____
Onions, chopped	3 lb	_____
Apples, raw, with skins	6	_____
Ham, chopped fine	¼ lb	_____
Tomatoes, medium	1 #2½ can	_____
Cream	½ gal	_____

12. Change the following recipe to 15 portions. (Give realistic amounts.)

Irish lamb stew.   Yield: 50 portions

Ingredients	Standard	15 portions
Water, boiling	2 gal	_____
Lamb, fores, cut in ¾" cubes	17 lb	_____
Potatoes, sliced	6 lb	_____
Pearl onions	100	_____
Potatoes, Parisienne	100	_____
White turnips, ½" cubes	1 pint	_____
Carrots, ½" cubes	1 qt	_____
Salt and pepper	to taste	_____

68

59

Objective: You will learn how to divide fractions.

Related Information:

At times it is necessary to divide a number by a fraction. If you understand how to multiply fractions, you will have no trouble dividing by fractions. To divide by a fraction, *invert* the fraction (turn it upside down) and *multiply*. It's as easy as that!

Example 1 — dividing a fraction by a fraction.

$\frac{3}{4} \div \frac{3}{8}$ Turn the $\frac{3}{8}$ upside down and change the sign of the operation.

$\frac{3}{4} \div \frac{8}{3}$ Now multiply in the same manner as in lesson 8.

$\frac{(3 \times 8 = 24)}{(4 \times 3 = 12)} \Rightarrow \Rightarrow \frac{24}{12} = 2$ (Answer)

Example 2 — dividing a whole number by a fraction.

Place the whole number over 1 and proceed as above.

$24 \div \frac{1}{4}$

$\frac{24}{1} \div \frac{1}{4}$

$\frac{24}{1} \times \frac{4}{1} = \frac{96}{1} = 96$ (Answer)

Example 3 — dividing a mixed number by a fraction or mixed number.

Change the mixed number(s) into improper fraction(s) and proceed as above.

$4\frac{1}{2} \div \frac{1}{8}$ Change $4\frac{1}{2}$ to an improper fraction.

$\frac{9}{2} \div \frac{1}{8}$ Invert divisor and multiply.

$\frac{9}{2} \times \frac{8}{1} \Leftarrow \Leftarrow \frac{(9 \times 8 = 72)}{(2 \times 1 = 2)} = \frac{72}{2} = 36$ (Answer)

Take each step carefully......Don't try to combine steps. That's a good way to make a mistake.

Note that when you divide by a proper fraction, your answer is *larger than the number you started with*. Do you understand that a fraction is less than a whole? Therefore if, for example, we were to divide 1" by 1/4, our answer would be larger than 1":

60

1/4 goes into 1" *four* times. Check this by working it as a division problem.

How many ½-cups of milk can we get from a gallon?

1. A gallon contains 16 cups.

2. Divide 16 by 1/2.

$$16 \div \frac{1}{2}$$

$$\frac{16}{1} \times \frac{2}{1} = 32 \text{ (half cups)}$$

ASSIGNMENT:

1. $\frac{1}{3} \div \frac{3}{4}$ _____ 2. $\frac{2}{3} \div \frac{5}{12}$ _____ 3. $2 \div \frac{1}{4}$ _____

4. $16 \div \frac{1}{5}$ _____ 5. $7 \div \frac{2}{3}$ _____ 6. $14 \div \frac{7}{8}$ _____

7. $\frac{1}{4} \div \frac{1}{4}$ _____ 8. $\frac{1}{8} \div \frac{1}{8}$ _____ 9. $18 \div \frac{1}{8}$ _____

10. $11\frac{1}{3} \div 2\frac{5}{6}$ _____ 11. $2\frac{3}{4} \div \frac{3}{8}$ _____

12. $1\frac{1}{2} \times 2\frac{3}{4} \div 1\frac{3}{8}$ _____ 13. $1\frac{1}{8} \div \frac{2}{3} \times 2\frac{1}{4}$ _____

14. $16 \text{ oz} \div 1\frac{1}{2}$ _____ 15. $16 \text{ oz} \div 2\frac{1}{4}$ _____

70

Lesson 1   'Addition of Whole Numbers

Objectives: 'You will review the addition of whole numbers.

You will gain some experience in adding figures on an adding machine.

"Do you mind if we just sit here and count calories for a while?"

Related Information:

Addition is basic to working with numbers. In the field of commercial foods, you may have to fill out guest checks, check orders, work out schedules, or compute costs in preparing meals.

You can improve your ability to add by practice. Accuracy is essential in the everyday world of work. Consider how embarrassing it would be to hand a customer an incorrectly totaled check:

Many restaurants provide adding machines for their employees, so as to prevent errors of this sort. It would be great if you could always depend upon having an adding machine handy. Unfortunately, you cannot. Therefore you *must* be able to add accurately, and with reasonable speed.

HOW TO AVOID ERRORS:

1. Copy numbers correctly.

2. Write your numbers neatly and in *straight columns*.

3. Double-check your figures by adding again from the opposite direction.

4. Double-check your figures by *estimating*.

5. Watch carefully for the placement of decimals.

When working with a long column of numbers, you can divide the column in half and work with two shorter columns.

When you see the following words or signs, it means *add*: "sum," "total," "+" or "addition."

In the assignment problems, you will be expected to first make all the calculations and then, if an adding machine is available, check your work on the machine.

ASSIGNMENT:

A. Add the following:

1.		2.		3.		4.		5.	
	86		78		99		69		98
	74		46		86		56		36
	63		32		74		64		94
	22		97		82		73		60
					102		47		26
							37		57

6.		7.		8.		9.		10.	
	33		643		438		434	$	76.43
	48		239		162		162		89.24
	24		103		321		301		57.89
	17		306		741		741		50.84
	35		709		246		642		24.86
	46		743		643		947		9.87

11.		12.		13.		14.	
	$6.57		$7.85		$23.43		$2.91
	1.27		8.56		18.62		6.89
	3.94		.55		59.79		.32
	4.15		2.35		.74		1.12
	5.34		14.77		.18		4.76
					7.40		2.13

15.	16.	17.	18.
$68.54	$12.14	$5468.00	$347.23
43.23	8.04	3254.00	64.22
42.78	11.32	179.00	11.11
34.14	9.87	1567.00	126.66
93.24	23.18	436.00	57.27
	67.34	37.00	55.34

72

B. Copy the following figures in vertical columns and add them.

1. 99 + 295 + 68 + 13

2. 8 + 108 + 22 + 26 + 15

3. 65 + 9 + 200 + 32 + 5

4. 26 + 189 + 12 + 74 + 14

5. 11 + 12 + 7 + 63 + 148

6. 38 + 7 + 106 + 14 + 678

7. $4.65 + 2.35 + 1.07

8. $ .08 + .23 + .94 + 1.00

9. $ .75 + .45 + .19 + .34

10. $234.88 + 49.87 + 2.36

73
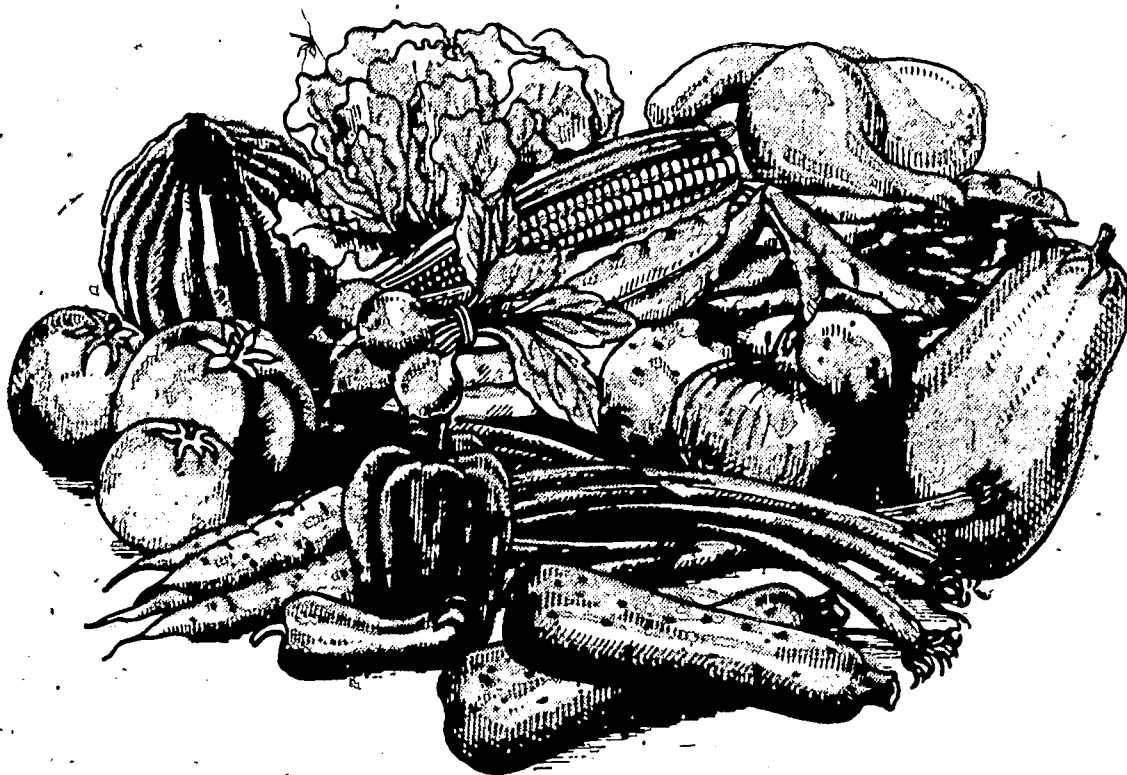
Lesson 2   The Guest Check

Objectives: You will learn how to fill out a guest check and why each part of it is important.
You will gain practice in addition by working with guest checks.

Related Information:

    The guest check is a record of what the customer has eaten. The guest check is different for each restaurant. Some are pre-printed (see next page). The pre-printed form is used where there are a set number of food items offered. It is a simple matter to check off each item on such a guest check: this saves time and errors. The pre-printed check shown is from a pancake house. Similar checks are in use at many of the fast-food places.

    The guest check we use in school is a simple form. Look at the empty spaces at the top. It is not necessary in school to enter the table number or number of persons fed. In a restaurant, however, it is. Where more than one person is covered by the bill, it is important for the cashier to know this. She must look to see that all customers walking out have properly paid their bill.

    The checks are numbered, and this may be useful for record-keeping by the office.

    The "server number" is useful to show the amount of work one person has done. Where waitresses rotate assignments, this can make sure that each one has had a fair number of customers. Waitresses receive tips when they serve; therefore someone who has served fewer customers may make less money.

GUEST CHECK

TABLE NO	NO PERSONS	CHECK NO	SERVER NO
		17694	

How to fill out the guest check.
(Demonstration with overhead projector)

1. Items in the top row were explained above.

2. In first column, enter the number or quantity of each item.

3. Describe the item in the center section.

4. The two columns on the right are for the amount of each item. Remember to keep the dollars and cents in the proper columns. Keep columns neat for easy addition.

5. Total up columns by adding.

6. Look up tax on tax chart and enter below total.

7. Add tax total to get full amount to be paid.

65

The Pre-Printed Guest Check

1. Note: All items are printed on the form, saving time and energy. This also keeps the guest check neat.

2. Persons, table, and waitress-number are self-explanatory.

3. Enter quantity in left-hand column. Room is also provided for an entry next to the description of the different types of pancakes.

4. Note these abbreviations.

   CE = _____

   UP = _____

   PO = _____

   SCR = _____

   R = _____

   M = _____

   W = _____

   B.L.T. = _____

5. Note how clearly the total, the sales tax, and the gross total are shown. This is particularly helpful for the customer.

6. Note instructions to pay the cashier.

PERKINS' PANCAKE HOUSE					
PERSONS	TABLE	WAITRESS	235702		
BUTTERMILK	BUCKWHEAT	SWEDISH R.			
BANANA	.BLUEBERRY	FRENCH R.			
PECAN	DOLLAR—6	STRAWBERRY R.			
CORN	DOLLAR—15	PEACH R.			
COCOANUT	HAWAIIAN	APPLE R.			
CHOC. CHIP	POTATO	SOUR C. R.			
PIGS BLANKET		FRENCH TOAST			
PL. WAFFLE	APPLE WAFFLE	HAM WAFFLE			
BLUE WAFFLE	STRAW. WAF	BACON WAF			
PECAN WAF	COCOANUT WAF	PEACH WAF			
PLAIN OMEL.	HAM OMEL.	BACON OMEL.			
CHEESE OMEL.	H. & C. OMEL.	MUSH OMEL.			
HAM STEAK		MINCED HAM & SCR.			
EGGS:	OE	UP	PO	SCR	
JR. PLATE	OE	UP	PO	SCR	
HAM & EGGS	OE	UP	PO	SCR	
BACON & EGGS	OE	UP	PO	SCR	
SAUS. & EGGS	OE	UP	PO	SCR	
L. SAUS. EGGS	OE	UP	PO	SCR	
SIDE: 2 EGGS	OE	UP	PO	SCR	
SIDE: 1 EGG	OE	UP	PO	SCR	
SIDE: HAM	BACON	SAUS.	L. SAUS.		
DEL. STK. R. M. W.		CHICKEN			
TUNA PLATE		FRIED SHRIMP			
FISH		CHOP. SIRL. R. M. W.			
PERK. BURGER R. M. W.		HAM SAND.			
B.L.T. SAND.		CHEESE-BURGER			
HAM & CHEESE		TUNA SAND.			
ROAST BEEF SAND.		CORN BEEF SAND.			
S. JUICE		L. JUICE	MELON		
SODA		H. CHOC.	GP. FRUIT		
COFFEE		TEA	MILK		
TOAST					
			TOTAL		
			SALES TAX		
PLEASE PAY CASHIER		GROSS TOTAL			

ASSIGNMENT A:

Problems 1 – 8 on the next page are to be done on the eight blank guest-check forms supplied in this book.

Each problem indicates what has been ordered by customers at the CLAM HUT restaurant. Do each problem on a separate guest check. Look on the HUT menu for the price of each item. Look each item up carefully. A shrimp salad sandwich is very different from a shrimp-salad platter.

Use the tax chart below to compute the tax on your guest check. Notice that the amounts of the purchase are given in "ranges": .11 to .20, .21 to .40, etc. If the amount of the purchase is 11 cents, you put down 1 cent tax. If the amount is 16 cents, you still put down 1 cent tax. If the amount is .22, how much would you put down? If your answer is 2 cents, you are correct.

if the bill comes to over $10.00, take the amount over $10.00, look that up on the chart, and add it to the 50 cents for the first $10.00.

Example: $14.60 bill $ 4.60 = .23 tax
                              10.00 = .50 tax
                                   .73 Total tax

5% — SALES TAX			
Amount of Purchase	Sales Tax	Amount of Purchase	Sales Tax
$ .11 to $ .20	$ .01	$5.11 to $5.20	$ .26
.21 to .40	.02	5.21 to 5.40	.27
.41 to .60	.03	5.41 to 5.60	.28
.61 to .80	.04	5.61 to 5.80	.29
.81 to $1.10	.05	5.81 to 6.10	.30
$1.11 to 1.20	.06	6.11 to 6.20	.31
1.21 to 1.40	.07	6.21 to 6.40	.32
1.41 to 1.60	.08	6.41 to 6.60	.33
1.61 to 1.80	.09	6.61 to 6.80	.34
1.81 to 2.10	.10	6.81 to 7.10	.35
2.11 to 2.20	.11	7.11 to 7.20	.36
2.21 to 2.40	.12	7.21 to 7.40	.37
2.41 to 2.60	.13	7.41 to 7.60	.38
2.61 to 2.80	.14	7.61 to 7.80	.39
2.81 to 3.10	.15	7.81 to 8.10	.40
3.11 to 3.20	.16	8.11 to 8.20	.41
3.21 to 3.40	.17	8.21 to 8.40	.42
3.41 to 3.60	.18	8.41 to 8.60	.43
3.61 to 3.80	.19	8.61 to 8.80	.44
3.81 to 4.10	.20	8.81 to 9.10	.45
4.11 to 4.20	.21	9.11 to 9.20	.46
4.21 to 4.40	.22	9.21 to 9.40	.47
4.41 to 4.60	.23	9.41 to 9.60	.48
4.61 to 4.80	.24	9.61 to 9.80	.49
4.81 to 5.10	.25	9.81 to 10.10	.50

67

Try the following:

a.   75¢ total ... tax = _____

d. $10.80 total ... tax = _____

b. $1.24 total ... tax = _____

e. $15.20 total ... tax = _____

c. $5.60 total ... tax = _____

f. $22.99 total ... tax = _____

ASSIGNMENT A:

1. Frank Taylor ordered the following at the Clam Hut restaurant: A cup of clam chowder, a combination hot seafood platter, and iced tea. (Don't forget to *write the item out* on the guest check.)

2. Barbara Henson ordered 1/2 dozen clams, fried shrimp, ice cream cake roll, and milk.

3. The Kozak family of four ordered: 3 cups of clam chowder, 1 lobster bisque, a bucket of steamers, 1 fried clams, 1 baked bluefish, 1 shrimp salad platter and 1 chicken in the basket. 4 large soft drinks completed their order.

4. Joanne Jones ordered an appetizer of shrimp cocktail and an order of fried oysters. She completed her order with coffee and cheesecake.

5. Rochelle and Mike went out to dinner together and ordered a clam bucket of steamers, 2 cups of clam chowder, 1 fried scallops, 1 stuffed flounder. Rochelle had a large soft drink and Mike had iced tea.

6. Lucy dropped into the Hut for lunch and ordered tomato juice, a hamburger basket, and hot chocolate.

7. The Carr family of four ordered 2 tomato juice and 2 shrimp cocktails, 1 order of broiled fillet, 1 cold seafood platter, 1 lobster salad platter, 1 hot seafood combination, 2 milks and 2 coffees.

8. Betsy and Terry went to the Hut and ordered 2 shrimp cocktails, 2 cups of clam chowder, 1 fried shrimp and 1 fried soft clams, 2 soft drinks, and 2 ice cream rolls.

77

The <u>The</u> CLAM HUT

Nibblers

Tomato Juice	.25
Cup of Clam Broth	.25
Baked Stuffed Clams	1.75
Shrimp Cocktail	1.75
Seafood Cocktail	2.90

STEAMERS

CLAM BUCKET	2.90
Extra Butter and Broth	.15
(when AVAILABLE)	

MANHATTAN CLAM CHOWDER

Cup .... .50

CLAMS ON THE HALF SHELL

1/2 Dozen	1.90
1 Dozen	2.40

LOBSTER BISQUE

Cup .... .75

From the Galley

Tuna Salad Platter	2.95
Filet Platter (fried or broiled)	2.95
Fried Smelts	2.95
Baked Stuffed Clams	3.25
Chef's Seafood Salad	3.60
Fried Soft Clams	4.25
Fried Shrimp	4.25
Baked Bluefish	4.25
Baked Bass	4.25
Fried Maryland Oysters	4.25
Shrimp Salad Platter	4.25
Soft Shell Crab	4.25
Crab Salad Platter	4.25
Stuffed Flounder	4.50
Fried Scallops (or broiled)	4.50
Lobster Salad Platter	6.25

ALL CHILDREN'S PLATTERS—HALF PRICE

*All Platters include french fries, cole slaw
tartar sauce and a tossed salad
A specialty of the house dressing   Russian
Shrimp or Oil and Vinegar are available*
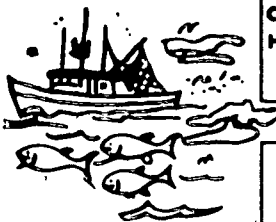
COMBINATION HOT SEAFOOD — A
Hearty Eater's Delight ... Filet, Shrimp,
Scallops, Clams, French Fries & Cole Slaw.... 5.75

COLD SEAFOOD PLATTER — Half a
cold boiled Lobster, Shrimp Salad, King Crab
Salad, French Fries and Cole Slaw 5.75

ALASKAN KING CRAB LEGS
and CLAWS
PRICED ACCORDING TO THE MARKET

NORTH AMERICAN LOBSTERS

CHIX		2 LBS.
1½ LBS.		3 LBS. & UP

ALL LOBSTERS ARE PRICED ACCORDING TO SIZE
A Good Baked Lobster Takes Time to Prepare

A Light Bite ...

Sandwiches

Tuna Salad	.75
Filet	1.00
Fried Soft Clam	1.50
Fried Shrimp	1.90
Shrimp Salad	1.95
Soft Shell Crab	1.95
Crab Salad	1.95
Lobster Salad	3.00

Baskets

Hot Dog Basket	1.25
Hamburger Basket	1.25
Cheeseburger Basket	1.35
California Basket	1.00
Chicken in the Basket	2.95

*All Baskets Include
French Fries and Applesauce*

Sea Sweets ...

Ice Cream Coke Roll	.60
Jello	.50
Pudding	.60
Cheesecake	1.00

Sea Sips ...

Tea	.25
Coffee	.25
Sanka	.30
Milk	.30
Ice Tea	.30
Soft Drinks	.30
Tab	.35
Hot Chocolate	.35

78

GUEST CHECK

Table No.	No. Persons	Check No. 17694	Server No.

GUEST CHECK

Table No.	No. Persons	Check No. 17695	Server No.

GUEST CHECK

Table No.	No. Persons	Check No. 17696	Server No.

GUEST CHECK

Table No.	No. Persons	Check No. 17697	Server No.

GUEST CHECK

Table No.	No. Persons	Check No. 17694	Server No.

GUEST CHECK

Table No.	No. Persons	Check No. 17695	Server No.

GUEST CHECK

Table No.	No. Persons	Check No. 17696	Server No.

GUEST CHECK

Table No.	No. Persons	Check No. 17697	Server No.

ASSIGNMENT B:

1. Total Joanne's weekly tips: Monday $8.45, Tuesday $7.90, Wednesday $6.90, Thursday $5.50, Friday $10.25. _____

2. Sarah earned the following tips: $12.75, $10.35, $9.70, $11.80, $13.20. Find the sum of Sarah's tips for the week. _____

3. Karen earned the following weekly wages for October: $125.70, $114.20, $109.60 and $120.85. Find her total for the month. _____

4. Mrs. Brown's wages amounted to the following for the month: $156.23, $174.55, $118.45, $166.23. Find the total of her wages for the month. _____

5. There were six outgoing orders for the diner on Monday, for $14.65, $9.80, $6.75, $3.80, $.75, and $7.90. What does this total? _____

ASSIGNMENT C — Bakeshop Supplement

Use the bakeshop pricelist and order blanks for the following problems:

1. Mrs. Kurtiak ordered the following items from the bake shop for Oct. 15th: 1 dozen dinner rolls, 1 rye bread (small), and two lbs of mini-Danish.

2. Mrs. Jones ordered a layer cake (large cream), a dozen apple turnovers, a half-dozen eclairs, and one coffee ring. She is going to pick up the order on Nov. 30.

3. Mr. Delaney ordered 1 large apple pie, 1 large peach pie and a dozen cream tarts. In addition he selected 1 large pumpernickel and 3 lbs of rye bread. The date of his order was June 12th.

4. Mrs. Cohen ordered 2 dozen onion rolls, 1 large chale, and 3 dozen filled danish pastry for Nov. 8th.

5. Mrs. Brown is celebrating her anniversary on January 25 and placed an order for a single-layer sheet cake to be picked up that day. She left a $3.75 deposit.

6. Mrs. Stevens placed an order for 1 dozen jelly donuts, ½ dozen cream donuts, 1 small fruit pie, 3 lbs butter cookies, and 4 dozen large hard rolls, all to be picked up on November 24.

7. Mrs. Wersan left an order for October 10, for 9 lbs of mini-Danish, a small white bread, a large rye bread, a coffee ring, and 6 charlotte russes.

8. Mrs. Soto picked up 2 coffee-cake loaves and a large white bread, and placed an order for a double-layer sheet cake, to be ready December 23. She paid the full amount for everything.

BAKESHOP PRICE LIST

BREAD AND ROLLS		DONUTS, PIES, CAKES, COOKIES	
DINNER ROLLS	.05	JELLY DONUTS	.10
LARGE SOFT ROLLS	.09	CREAM DONUTS	.12
SMALL HARD ROLLS	.05	TWIST AND RING DONUTS	.10
LARGE HARD ROLLS	.09	LARGE SUGAR COOKIES	.06
RYE ROLLS	.12	BUTTER COOKIES	$1.40 lb.
ONION ROLLS	.09	BUTTER COOKIES	.70 ½ lb.
TWIST ROLLS	.15	BUTTER COOKIES	.35 ¼ lb.
BAGELS	.09	SMALL FRUIT PIES	.65
HOAGIE ROLLS	.10	SMALL CREAM PIES	$ 1.30
SMALL WHITE BREAD	.25	LARGE FRUIT PIES	$1.30
LARGE WHITE BREAD	.50	LARGE CREAM PIES	$1.90
SMALL RYE BREAD	.40	FRUIT TARTS	.30
LARGE RYE BREAD	.80	CREAM TARTS	.40
RYE BREAD BY THE POUND	.40	CHARLOTTE RUSSE	.25
SMALL PUMPERNICKEL BREAD	.45	CUPCAKES	.10
LARGE PUMPERNICKEL BREAD	.90	SMALL BUTTERCREAM LAYERS	$1.15
SMALL CHALE TWIST BREAD	.50	LARGE BUTTERCREAM LAYERS	$1.50
LARGE CHALE TWIST BREAD	.65	SMALL CREAM LAYERS	$1.35
LINSTER TARTS	.20	LARGE CREAM LAYERS	$1.90
COFFEE BUNS	.20	ECLAIRS	.30
CHINESE COOKIES	.06	BROWNIES	.12
		MINI DANISH	$1.65
SINGLE-LAYER SHEET CAKE	$7.50 *	FILLED DANISH PASTRY	.15
		PLAIN DANISH PASTRY	.12
DOUBLE-LAYER SHEET CAKE	$15.00 *	APPLE TURNOVERS	.15
		COFFEE RINGS	.90
		COFFEE CAKE LOAVES	.95

82

* 50% deposit required

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted _____
  (day)   (date)
Name _____

No.	Item	@	Ext.
	Total		

		Amt.	Date
Taken by			
Put up by			
Given out by			

74

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted
_____
   (day)   (date)

Name _____

No.	Item	@	Ext.
	Total		

		Amt.	Date
Taken by			
Put up by			
Given out by			

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted
_____
   (day)   (date)

Name _____

No.	Item	@	Ext.
	Total		

		Amt.	Date
Taken by			
Put up by			
Given out by			

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted
_____
   (day)   (date)

Name _____

No.	Item	@	Ext.
	Total		

		Amt.	Date
Taken by			
Put up by			
Given out by			

MIDDLESEX COUNTY
VOCATIONAL AND TECHNICAL HIGH SCHOOL
BAKE SHOP

Wanted
_____
   (day)   (date)

Name _____

No.	Item	@	Ext.
	Total		

		Amt.	Date
Taken by			
Put up by			
Given out by			

75

84

UNIT III – ARITHMETIC OPERATIONS

Lesson 3   Reading and Writing Numbers

Objective: You will review writing numbers from words and writing words from numbers.

Related Information:

As soon as you get your first full-time job, or perhaps before then, you will no doubt open a checking account at a bank. Every check you write must have the dollar-amount written two ways, in figures and in words. You can see how important it is to know how to do both accurately.

When working as a cook or performing other duties in food service, it is often necessary to translate numbers into words in passing information on to other personnel. When listening to instructions from other people, you must be able to translate words into numbers and write them correctly.

Orders for supplies are often placed over the phone. It is good procedure to have the person receiving the order repeat the details of the order to prevent errors. Make certain the quantities are indicated clearly.

ASSIGNMENT:
A. Change the following words into numbers:

1. Three hundred

2. One hundred and forty-three

3. Sixteen dollars and seven cents

4. Seventy-nine dollars and sixty-three cents

5. One hundred and sixty degrees.

6. One thousand five hundred and twenty-three

7. Three thousand and ten

8. The new delivery truck cost five thousand four hundred and sixty-three dollars and seventy-five cents.

9. John's wages for the year came to twelve thousand two hundred and five dollars.

10. Jean earns two dollars and sixty-six cents an hour.

11. Let the roast cook for two hours and fifteen minutes.

12. The order totaled ninety-seven dollars and twenty-two cents.

13. Your invoice number is seven thousand five hundred and four.

14. Send two dozen platters, catalog number three hundred and thirteen.

76

85

15. If you have any complaints on your order, call six-three-four—seven five hundred.

_____

16. Our restaurant grossed three hundred and fifty thousand dollars for the year.

_____

17. Check our requisition number one thousand one hundred and twelve.

_____

18. We do not have item seven on your purchase order number three thousand two hundred and seven.

_____

19. Deliver the order on November seventh, to fourteen-forty Broadway.

_____

20. Three hundred twenty-four thousand, five hundred and seventy-two satisfied customers.

_____

B. Rewrite the following numbers in words:

1. $17.05 _____

2. $189.76 _____

3. 1003 _____

4. 10,008 _____

5. 7,653 _____

6. 982 _____

7. $71.93 _____

8. $23.87 _____

9. 124,000 _____

10. 19,000,238 _____

11. $1,600,058 _____

12. $54,006 _____

13. $4,694.75 _____

14. $8.97 _____

15. $15.02 _____

.77

Lesson 4   Subtraction of Whole Numbers
_____

Objective: You will review the subtraction of numbers.

Related Information:

Subtraction is used in many operations involving money. For example, you earned $100.00 last week and your employer *deducted* $20.00 from your pay for taxes and social security. You found $80.00 in your pay envelope. When you deduct you are subtracting: 20 dollars subtracted from 100 dollars leaves 80 dollars. The amount you earned is called your *gross* pay; the amount you take home is called your *net* pay.

The cafeteria showed $1,000.00 on the cash-register tape last week. The total amount of money taken in is called *gross sales* or *gross income*. The school had to pay for food, labor, electricity, gas, heat, etc. All these items are called *expenses*, and they must be paid out of the gross income. The *net income* (or profit) is what you have left after subtracting the expenses. Look at the drawing below. The cafeteria does not keep the gross income......it keeps the net income.

| GROSS INCOME | — | EXPENSES | = | NET INCOME (PROFIT) |

| Total taken in | — | wages, materials, electricity, fuel, taxes | = | What is left for the company |
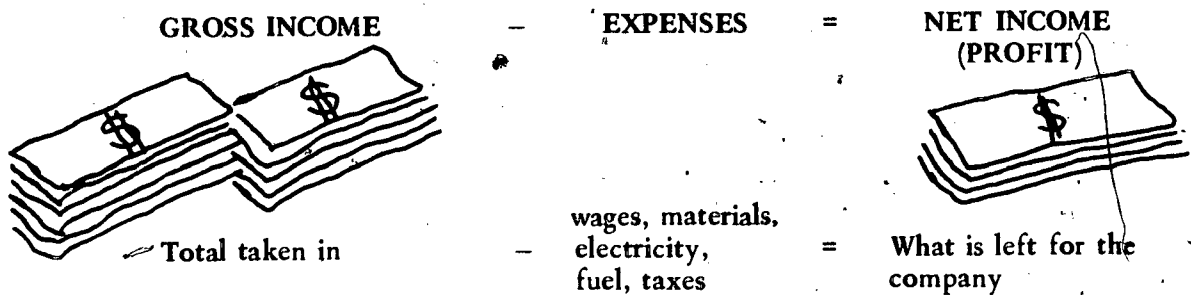
In subtraction we use the sign "— ". In word problems the words "subtract," "difference," "minus," "deduct," or "take away" are some of the words used to indicate a subtraction operation. Others are "net" as opposed to "gross," "amount left," "take-home (pay)," and others.

ASSIGNMENT, Part A:

1.   87   2.   538   3.   4328   4.   2317   5. $4.15
      − 34   − 159   −   13   − 603   − .87

6. $34.18   7.   8593   8.   5994   9.   23,108   10. 489,340
     − 5.23   − 3056   − 5917   − 2,550   −265,932

ASSIGNMENT, Part B:

1. The cafeteria received 300 containers of milk yesterday. At the end of the day 26 were left. How many containers of milk had been sold?

_____

2. Four dozen chocolate cones were available for sale this morning, and 32 were sold during lunch. How many cones were left?

_____

3. Forty-eight #10 cans of pear halves were shown on the inventory list at the beginning of the month. Six were left on the shelf at the end of the month. How many cans had been used?

_____

4. Joanne took in $18.90 in tips at the dinner meal. She gave $4.70 to the busboy. How much did she have left?

_____

5. Karen's gross pay for the week came to $156.78. Her deductions amounted to $35.13. What was her take-home pay?

_____

6. Sales at the Griddle restaurant came to $28,560 for the month. Expenses amounted to $27,150. What was the net profit?

_____

7. The difference between 18 and 11 is:

_____

8. Two hundred and twenty-five dollars minus one hundred and fifty-three dollars amounts to:

_____

9. The restaurant had 60 pounds of hamburger patties on hand at the beginning of the week. Twelve pounds were used on Monday, 5 pounds on Tuesday, 16 pounds on Wednesday, 21 pounds on Thursday. How many pounds were on hand for Friday's meals?

_____

10. Sally is a waitress. Last week she took home $158.40. Only $120.67 of this was in her pay envelope; the rest was in tips. How much had she earned in tips?

_____

11. A basket of grapes weighed 10 pounds. If the basket itself weighed 1 pound, what was the net weight of the grapes?

_____

12. A store clerk weighed out 2 pounds of fish fillets in a cardboard tub. If the tub weighed 1 ounce, how much fish was there?

_____

88

Objective: You will use subtraction in making out production reports.

Related Information:

It is important to know how much of each item to prepare. While some items can be stored and sold the next day, or frozen, others cannot, and may represent waste. Waste costs money, and the objective of every business is to to make a profit.

Guessing or estimating may be necessary when a business first opens, but once a record of what has been sold can be obtained, it is then possible to plan more accurately for the next day, week, or month.

A **production report** lists the items of food that have been made, what is left over, and what has been sold. Below you will find a section of a production report form, showing how to fill one out.

FOOD	Number Prepared	Number Returned	Number Sold
steaks	60	8	52

Note: Subtract the number returned from the number prepared, and you have the number sold.

Number prepared: 60
Number returned: 8
Number sold: 52

ASSIGNMENT:

1. Using the following information, fill out a production report:

Food	Number Prepared	Number Returned
Soup	100	18
Baked pork chops	65	12
Chicken croquettes	40	6
Mashed potatoes	100	15
Gravy	3 qts	1 pint
Layer cakes	6	1
Fruit cups	50	15
Rice custard	30	13
Ham sandwiches	25	5
Cheese sandwiches	20	3

PRODUCTION REPORT   Date: _____

Food	Number Prepared	Number Returned	Number Sold
A			

Name of person preparing report: _____

90

2. Fill out a production report using the following information:

Food	Number Prepared	Number Returned
Tomato soup	60	10
Clam chowder	50	0
Potato soup	30	9
Split pea	60	10
Egg salad sandwiches	30'	9
Tapicoa pudding	30	10
Apple pie	50	30
Pumpkin pie	50	0
Hamburger and roll	125	19'
Frankfurter and roll	75	14

PRODUCTION REPORT   Date: _____

Food	Number Prepared	Number Returned	Number Sold

Name of person preparing report: _____

3. The cook ordered 25 porterhouse steaks. Five were left at the end of the day. There was a record of 19 sold. Does this record balance? What is the difference? What might be some reasons for the discrepancy?

4. The production report showed that 75 portions of spaghetti were prepared. The server was able to get 70 from the pan. What was the difference? How might it be accounted for?

5. Sixty-five baked custards were prepared. The counter server accidentally dropped four. How many were actually available for sale?

6. The sandwich cook received 45 slices of ham, 20 slices of cheese, and 40 slices of ham bologna for sandwiches. At the end of the day there were 5 slices of ham, 10 slices of cheese, and 15 slices of bologna left. How many sandwiches of each kind had been sold if one slice of each was used for a sandwich?

82

Lesson 6·   Multiplication

Objective: You will review the multiplication of numbers.

Related Information:

Multiplication is used in many operations around the restaurant.

Example 1: To compute costs of materials from price lists:
12 cans at $4.10 a can. Multiply 12 X 4.10.

$$\begin{array}{r} \$\ \ 4.10 \\ \times\ 12 \\ \hline \$\ 49.20 \end{array}$$

Example 2: To work out pay for work:
Joan worked 40 hours at $2.25 per hour.

$$\begin{array}{r} \$\ \ 2.25 \\ \times 40 \\ \hline \$\ 90.00 \end{array}$$

Example 3: To change quantities in recipes:
A recipe calls for 3 quarts of creole sauce. To get five times the amount:

$$5 \times 3 = 15 \text{ qts}$$

Certain words will help you recognize multiplication problems. We have already seen that the word "of" in many fraction problems usually indicates the operation of multiplication; similarly the word "at" or the symbol @ does (so many *at* such and such a price). "Times" and "X" and "find the product" also indicate multiplication, as you know.

ASSIGNMENT:

Multiply the following:

1. 156	2. 543	3. 765	4. 784
X 8	X 60	X32	X 209

92

5. 3,595
    × 890

6. 1,876
    × 607

7. $ 4.75
    × 40

8. $ 144
    × 2.10

9. $5.25
    × 12

10. $ 1.85
    × 23

11. $ 18.95
    × 16

12. 6092
    × 104

REFERENCE PAGE

The following information summarizes the material on measurements (in Unit I) and may be useful to you while working on the assignments in this book:

Abbreviations

t or tsp	= teaspoon	bu	= bushel
T or Tbsp	= tablespoon	bch	= bunch
c	= cup	oz	= ounce
pt	= pint	lb or #	= pound
qt	= quart	gal	= gallon

Equivalents

3 tsp	= 1 T		2 pts	= 1 quart
2 T	= 1 fl oz		4 c	= 1 quart
8 fl oz	= 1 cup		4 qts	= 1 gallon
16 T	= 1 cup		16 oz	= 1 pound
2 c	= 1 pint			

One #10 can will yield approximately 25 servings (4 oz each)
1 quart of any liquid equals approximately 2 lbs.

MULTIPLICATION TABLE

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

85

Lesson 7 _____ Trade-Related Multiplication Problems

Objective: You will use multiplication in several different types of work in the foods
               trades.

Related Information:

       In this lesson you will practice multiplying numbers just as you might have to in
the trades.

CHANGING RECIPES BY MULTIPLICATION

ASSIGNMENT:
Part A: Room is provided for two changes on each recipe given below. Your instructor
        may wish to change the instructions, however, from those given. Express each
        answer in units that you would be likely to use.

Beef stroganoff.   Yield 48 portions.   New yields 144 and 240.

Ingredients	Amount	New Amount	New Amount
Tenderloin tips	12 lbs		
Vinegar	1 cup		
White wine	1 cup		
Rich brown sauce	3 qts		
Sour cream	24 oz		
Mushrooms, sliced	24 oz		
Butter	6 oz		

Potato salad.   Yield 50 portions   New yields 200   and 300.

Ingredients	Amount	New Amount	New Amount
Celery, diced fine	1½ lbs		
Onion, minced	3 oz		
Hard-cooked eggs, chopped	8		
Pimentos, diced, drained	7-oz can		
Mayonnaise	1 qt		
Potatoes	12 lbs		
French dressing	5 oz		
Salt and pepper	to taste		
Lettuce	4 heads		

9 5

French salad dressing .   Yield 1 qt.   New yields 3 qts   and 7 qts.

Ingredients	Amount	New Amount	New Amount
Vinegar, cider	1 cup		
Salt	1 tbsp		
Mustard, dry	1 tbsp		
Sugar	1 tsp		
White pepper	½ tsp		
Salad oil	3 cups		

Manhattan clam chowder.   Yield 50 portions.   New yields 200   and 800.

Ingredients	Amount	New Amount	New Amount
Clams, chopped	3 qts or 2 # 5 cans		
Water	5 qts		
Potatoes	1 lb		
Salt pork, chopped fine	12 oz		
Garlic	1 tsp		
Celery	1 lb		
Onions	2 lbs		
Carrots	8 oz		
Leeks, diced small	8 oz		
Peppers, green, diced small	8 oz		
Tomatoes, canned, chopped	1 qt		
Sachet bag	1		
Salt	1½ tbsp		
White pepper	½ tsp		
Worcestershire sauce (optional)	1 tbsp		

96

Part B: Costs and Wages

1. The cafeteria ordered 4 cases of sliced mushrooms at $32.18 a case (4 #10 cans to the case). What was the amount due on the order?

   _____

2. Jim Reynolds worked 40 hours at $3.78 an hour. What was his gross pay for the week?

   _____

3. The Admiral restaurant ordered:
   8 Chinese strainers at $9.50 ea
   3 Wire whips at $3.20 ea
   4 slotted turners at $.90 ea
   5 # 20 ice cream scoops at $3.95 ea
   What was the total amount of the order?

   _____

4. The cafeteria was planning to replace the chairs with new tubular steel stacking chairs at $12.95 apiece. How much would 285 chairs cost?

   _____

5. What is the total cost of 7 polyethylene containers at $8.50 each?

   _____

6. Oscar worked 8 hours on Monday, 6 hours on Tuesday, 7 hours on Wednesday, 8 hours on Thursday, and 4 hours on Friday. At $2.85 an hour, what was his gross pay for the week?

   _____

7. Compute the cost of 5 cases of lasagna at $3.92 a case.

   _____

8. The Jones family visited the Admiral restaurant and ordered 4 filet dinners at $4.75 ea. What was the total amount on the bill?

   _____

9. Joan works 4 hours a day, 5 days a week, at $2.10 an hour. What is her gross pay?

   _____

10. The electric bill for the Hut restaurant averages $220 a month. How much would it come to for a year?

   _____

Part C: The Counter Report

The counter report is similar to the production report you filled out in lesson 5, but it contains additional information. The counter report includes the price of the item.

After determining how many items have been sold, you must multiply the unit price (the price for one) by the number sold to determine the total value of what has been sold.

The counter report, if done accurately on all items, would give the restaurant supervisor some control over what is being sold. The total value as shown on the counter reports should equal what is shown on the cash register.

97

COUNTER REPORT   Date: _____

Food	Number Prepared	Number Returned	Number Sold	Price per item	Total value sold
Tomato soup	75	25		.30	
Egg salad sand.	50	8		.60	
Tuna sandwich	50	12		.70	
Ham sandwich	50	0		.85	
Veal cutlet	75	17		1.10	
Tuna salad	25	3		.95	
Apple pie	40	5		.35	
Custard	50	9		.25	
Chocolate layer	30	6		.35	
Cup cakes	30	2		.20	

Total: _____

Name of person preparing report

COUNTER REPORT   Date: _____

Food	Number Prepared	Number Returned	Number Sold	Price per item	Total value sold
Clam chowder	100	8		.40	
Split pea	75	14		.30	
Steak sandwich	75	4		.85	
Fish dinner	75	18		.85	
Chicken salad	40	11		.80	
Cottage cheese	15	2		.55	
Cherry pie	50	7		.35	
Milk	100	14		.25	
Coffee	50	0		.20	
Iced tea	50	15		.25	

Total: _____

Name of person preparing report

98

Recipe Cost Control Form

Prices for food items are determined by calculating the cost of all the ingredients that go into the recipe. In addition to the cost of the ingredients, the person who determines prices must add on:

Labor costs: wages for all the people working in the restaurant

Overhead: rent, heat, electricity, repairs, new equipment, insurance, taxes, etc.

Profit: the reason for the owner's being in business

The "recipe cost control form" helps determine how much a portion of food costs. This form could be a printed card kept on file and changed as prices change on the food items. Below is the explanation of the various items on the form.

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Yield: Portion Size:	
Ingredients	Quantity	Market Price	Extension
		Total cost	
Date Prices computed:		Cost per portion	

1. Recipe Item: the name of the food. Example: Hamburger platter

2. Yield: the number of portions from this recipe. (25, 50, 100)

3. Portion size: All foods, even hamburgers, can be made in different sizes.

4. Ingredients: the names of the items going into the food.

5. Quantity: the amount of each ingredient the recipe calls for

6. Market price: the price one unit of each ingredient costs the restaurant.

7. Extension: Here you *multiply* the quantity times the price.

8. Total cost: Add up all of the extensions.

9. Cost per portion: Divide the number of portions (yield) into the total cost to find the price per portion.

Don't forget: *this is not the selling price.* Remember the wages, overhead, and profit mentioned above. 90

Part D: Complete the following recipe cost control forms:

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Macaroni & Cheese Yield: 50 Portion Size: 6 oz. ladle	
Ingredients	Quantity	Market Price	Extension
Macaroni	6 lbs	.35 per lb	
Water	6 gallons		
Salt	3 oz	.08 per lb	
Butter	2¼ lbs	.90 per lb	
Flour	1½ lbs	.25 per lb	
Hot milk	3½ gallons	1.30 per gal	
Worcestershire sauce	3 T	. . . . . .	.20
American cheese	8 lbs	1.59 lb	
		Total cost	
Date prices computed:		Cost per portion	

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Sausage patty sandwich Yield: 50 Portion Size: 2 oz.	
Ingredients	Quantity	Market Price	Extension
Ground pork	15 lbs	1.49 per lb	
Luncheon meat	3 lbs	1.39 per lb	
Rolled oats	3 lbs	.45 per lb	
Eggs	10 eggs	.79 per doz	
Milk	3 qts	.35 per qt	
Pepper	1 T	. . . . .	.04
Salt	2 oz	.08 per lb	
Poultry seasoning	1 T	. . . . .	.06
		Total cost	
Date prices computed:		Cost per portion	

91

100

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Chicken Chow Mein
Yield: 50
Portion Size: 6 oz

Ingredients	Quantity	Market Price	Extension
Chicken, boiled	8 lbs	1.05 per lb	
Salad oil	1 pint	1.20 per qt	
Onion	6 lbs	.15 per lb	
Chicken stock	1½ gal		.60
Soy sauce	4 oz	.39 per 4-oz btl	
Bean sprouts	2 #10 cans	2.10 per #10 can	
Corn starch	14 oz	.39 per lb	
Cold water	1 pint		
		Total cost	
Date prices computed:		Cost per portion	

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Salisbury steak
Yield: 100
Portion Size: 3 oz

Ingredients	Quantity	Market Price	Extension
Chopped meat	20 lbs	.95 per lb	
Onion soup	1 envelope	.49 box of 2 env	
Garlic powder	1 tsp		.02
Eggs	9	.79 doz	
Bread crumbs	2½ lbs	.59 per lb	
Milk	2 cups	.33 per qt	
Beef base	½ cup	1.75 for 1-lb jar	
Water	1 cup		
		Total cost	
Date prices computed:		Cost per portion	

Objectives: You will review the practice of division.
                    You will solve shop-related problems by using division.

Related Information:

One use for division is in finding averages. For example, the teacher finds your test grade for the marking period by using division.

Example: Average these test scores: 90%, 70%, 80% and 75%.

Add: 90
        70
        80
      + 75

        315

Divide the total by the number of tests taken.

$$\frac{78}{4)\overline{315}} = 78\tfrac{3}{4} \text{ or } 79 \text{ average}$$

    28·

    35
    32

     3

We may have reason in food service to find the average number of a particular item sold per day in order to come up with an amount to prepare each day. (For this we would use results of production reports.)

We may have reason to find the average number of customers served per day, the average amount spent by each customer, the average number of hours worked by each employee, the average number of days absent, or the average amount of sales each week.

UNIT PRICING

Unit pricing means determining what we are actually paying for a standard amount of an item when we shop. Foods often come packaged in a variety of packages of different shapes and sizes. To actually compare them, it is necessary to compare the price of a standard quantity of each product.

One *ounce* of product A compared to one *ounce* of B.

One *pound* of product X compared to one *pound* of Y.

One *quart* of product M compared to one *quart* of product N.

To find the price of the standard unit we generally must *divide.*

1 dozen eggs cost 96¢. What is the cost of one egg?

There are 12 eggs to the dozen $12)\overline{96}^{\;8}$ 8 cents.

93

As the result of demands for consumer protection, some cities and states have passed laws making it necessary for stores to give the unit prices as well as the actual selling prices of the food packages.

For example, Brand X of pancake syrup costs .89 for 12 fluid ounces.

Unit price?   Divide 12 into 89 to find the price of *one* fluid ounce.

$$\begin{array}{r} .074 \leftarrow \text{Cost per fluid ounce} \\ 12\,)\overline{\,.89} \\ \underline{84} \\ 50 \end{array}$$

Brand Y, found in a larger size, costs 1.59 for 24 fluid ounces.

$$\begin{array}{r} .066 \Leftarrow \text{Cost per fluid ounce} \\ 24\,)\overline{\,1.59} \\ \underline{1\,44} \\ 150 \end{array}$$

Brand Y costs about 1¢ less per fluid ounce than Brand X.

Other considerations may, of course, override the saving of 1¢ per ounce. Taste, ingredients, or even the size and shape of the container are a few of the considerations for this particular product.

Sometimes we do not wish to purchase the quantity listed in the catalog.

Example: Plastic trays cost $13.80 a dozen. We wish to order only three trays. How much will 3 trays cost?

First find the *unit price:*
$$\begin{array}{r} 1.15 \Leftarrow \text{cost per tray} \\ 12\,)\overline{\,13.80} \\ \underline{12} \\ 18 \\ \underline{12} \\ 60 \\ \underline{60} \end{array}$$

3 X $1.15 = $3.45 for three trays

So you see that the words "average," "for each," "per unit" all suggest the operation of division, as well as the words "divide" or "go into."

ASSIGNMENT:

A. Divide the following:

1. 836 ÷ 4

2. 2390 ÷ 8

3. 1924 ÷ 37

4. 10800 ÷ 54

5. 2575 ÷ 15   _____

6. 829 ÷ 23   _____

7. $1875 ÷ 25   _____

8. $1500 ÷ 25   _____

9. 3750 ÷ 125   _____

10. $3490 ÷ 18   _____

B. Word Problems

1. Your grades in 6 tests were 75%, 90%, 100%, 80%, 60% and 85%. What is your test average?   _____

2. A can of pears costs $1.25, peaches $1.10, apricots $1.50. What is the average cost per can of fruit?   _____

3. Waitress Joan earned $8.60 in tips one day, Alice $6.70, Sarah $7.40. What was the average for our waitresses?   _____

4. On Monday our restaurant had 60 customers for breakfast, 78 on Tuesday, 94 on Wednesday, 82 on Thursday, 88 on Friday, 64 on Saturday and 112 on Sunday. What was the average number of customers we served this week for breakfast?   _____

5. Our restaurant took in $4,500 the first week in October, $5,800 the second week, $5,650 the third week, and $6,400 the fourth week. What was the average income of the restaurant per week for the month of October?   _____

6. A case of Old Bean Pot baked beans contains 12 No. 5 cans of beans. The price per case is $8.85. What is the price of one can?   _____

7. One case of Smoothee mayonnaise contains 12 bottles. The cost of the case is $12.79. What is the price of one bottle?   _____

8. A case of Prickle dill pickles costs $4.29. It contains twelve 16-ounce bottles. What does one bottle of pickles cost? What is the cost per ounce?   _____

9. Stainless steel teaspoons cost $1.60 per dozen. What is the unit price?   _____

10. Medium-heavy stainless steel spoons cost $1.20 a dozen. What is the unit price? How much will be saved per spoon over the spoons in problem 9?   _____

11. A No. 10 can of peaches costs $2.20. With 25 servings to the can, what will one serving cost? _____

12. Ten-inch heavy plastic plates regularly cost $14.40 per dozen. The special sale price is $6.60 per dozen.
    a. What is the unit cost at the regular price? _____
    b. What is the unit cost at the sale price? _____
    c. How much money is saved per plate at the sale price? _____

13. Mr. Clark's annual salary is $11,460. What is his monthly salary? What is his weekly salary? _____ _____

14. The eight cooks and waitresses decided to chip in to buy a wedding present for one of the employees. The present cost $34.90. What was each person's share? _____

15. Richard earns $140 a week for a 40-hour week. What is his hourly rate? _____

16. A restaurant can usually save money by buying in larger quantities. We generally ask for the "price break". One dozen sugar pourers cost $5.40 a dozen. When you buy 3 or more dozen, the price goes down to $4.80 a dozen.
    a. What is the saving per dozen at the "price break" price? _____
    b. How much is saved per pourer at the "price break" price? _____

17. Sugar-packet holders cost $7.20 a dozen in lots of 5 dozen or less. In lots of 6 dozen or over they cost $6.60 per dozen. How much is saved per holder in lots over 6 dozen? _____

18. Gloppy-brand ketchup costs 32¢ per 14-oz bottle. What is the unit price (price per ounce)? _____

19. Glazed doughnuts cost 69¢ per 12-oz package. At 6 per package, what is the price per doughnut? _____

20. Flavor-Flow instant coffee sells for $1.95 per 10-oz jar. Wake-Up brand costs $2.05 per 8 oz jar. What is the difference in cost per ounce between the two different brands? (Hint: find the unit price of each first.) _____

96

Objective: You will practice looking up prices and computing costs per unit.

Related Information:

On the next page is a price list for commercial food supplies, and on page 106 is a similar list for bakeshop ingredients. The prices on the list are the costs *per case*, per *100-lb bag*, etc. In your recipes you generally use *pounds, cans, cups, ounces*. In short, your recipes call for much smaller quantities than those you buy in.

You have to change the cost per 100 pounds to cost per pound or per cup or per ounce, as called for in the recipe. Begin with the price list and change the *cost per case* to unit cost (cost per can, pound, etc). This will help you to find the cost of smaller units as needed in your recipe.

The chart below may prove helpful in finding the unit you need.

Unit Chart

To find cost of:	When you know the cost of:	Divide:	(Because there are:)
1 pound	100-lb bag	100) price per 100 lb	(100 lb to bag)
1 ounce	1 pound	16) price per lb	(16 oz to lb)
1 # 10 can	1 case	6) price per case	(6 cans to case)
1 portion	1 #10 can	25)price per can	(25 portions to can)
1 piece	1 dozen	12) price per dozen	(12 pieces in doz)
1 dozen eggs	1 case	30)price per case	(30 doz eggs in case)
1 quart	1 gallon	4) price per gallon	(4 qts a gal)
1 pint	1 quart	2) price per quart	(2 pints to a qt)
1 cup	1 quart	4) price per quart	(4 cups to a qt)
1 fl oz	1 cup	8) price per cup	(8 oz to 1 cup)
1 tablespoon	1 cup	16) price per cup	(16 T to a cup)
1 tablespoon	1 ounce	2) price per oz	(2 T to an oz)
1 teaspoon	1 T.	3)price per T	(3 t to a T)
1 pinch	1 t	2)price per t	(2 pchs to a t)

Here are two examples of how you might use these tables:

Example 1:   Your recipe calls for 2 lbs brown sugar.
From the table on the next page, 24 1-lb boxes cost $12.25
One pound costs 24)12.25 =   .51 (Fill in the unit cost on the table.)
Then 2 lbs cost 2 × .51 = $1.02.

97

Example 2:   Your recipe calls for 4 oz salad oil

6 1-gallon cans cost $36.50
Dividing, you get $6.08 for 1 gallon. (Write it in on the chart.)
Divide 4 into $6.08 to find cost per quart = $1.52
Divide 4 into $1.52 to find cost per cup = .38
There are 8 oz to a cup, and you need 4 oz. That is ½ of .38, or .19

It is possible to take shortcuts to save time.....so think as you do the problems.
Round off your figures if necessary as you go along.

ASSIGNMENT A:
Compute the unit price for each food in the chart below.

Item	Size of Package Used	Amt. in Case (or Amt. Purchased)	Price Per Case (or Per Purchase)	Price Per Unit
Almond extract	1-qt bottle	1 bottle	$3.50	____ per oz
Apples, canned	#10 can	6 cans	14.50	____ per can
Bacon	1 lb	1 pound	1.13	
Basil, dry	1-lb can	1 can	7.65	____ per oz
Beans, kidney	#10 can	6 cans	11.10	____ per can
Beans, string	#10 can	6 cans	8.55	____ per can
Beef, bottom round	1 lb		1.69	
Beef, ground	10 lb	10-lb bag	10.40	____ per lb
Beef base	1-lb can	12 cans	21.45	____ per lb
Butter, prints	1 lb	30 lbs	23.40	____ per lb
Bread crumbs	1 lb	25-lb bag	8.75	____ per lb
Cabbage	head	med. head	.34	
Carrots, canned	#10 can	6 cans	7.25	____ per can
Celery	stalk	36 per crate	9.25	____ per stalk
Chicken, fryer	whole	per pound	.59	____
Chicken base	1-lb can	12 cans	21.45	____ per lb
Cheese, parmesan	1-lb jar	12 jars	24.36	____ per lb
Cinnamon	14-oz can	1 can	3.06	____ per oz
Corn starch	1-lb box	24 boxes	6.90	____ per oz
Eggs	1 egg	dozen	.85	____ each
Flour, all-purpose	100-lb bag	100-lb bag	14.95	____ per lb
Ginger	1-lb can	1-lb can	2.96	____ per oz
Ham, boneless	1 lb		1.79	
Lemons	1 lemon	1 doz	1.00	____ each
Lobster meat, cooked	1 lb		5.80	____ per oz
Margarine	1-lb print	30 lbs	16.50	____ per lb
Milk	qt	1 gallon	1.29	____ per qt
Mushrooms	1 lb		.99	____ per oz
Noodles	10-lb box	10-lb box	4.90	____ per lb
Oil, olive	1 gal can	1 can	10.61	____ per cup
Oil, salad	1 gal can	6 cans	36.50	____ per cup

99

Item	Size of Package Used	Amt. in Case (or Amt. Purchased)	Price Per Case (or Per Purchase)	Price Per Unit
Onions	50-lb bag	1 bag	5.75	_____ per lb
Parsley, dry flaked	8-oz can	1 can	1.75	_____ per oz
Peaches, canned	#10 can	6 cans	12.60	_____ per can
Peas, canned	#10 can	6 cans	8.90	_____ per can
Peppers, green	1 pepper	6 medium	.75	_____ each
Pickles, sweet	1 jar	jar (20 pickles)	.69	_____ per pickle
Pimentos	7-oz can	24 cans	11.67	_____ per can
Rice	25-lb bag	25-lb bag	12.20	_____ per lb
Salt	1lb 10oz box	1 box	.13	_____ per oz
Sugar, brown	1-lb box	24 boxes	7.45	_____ per lb
Sugar, granulated	100-lb bag	100-lb bag	19.75	_____ per lb
Tomatoes	#10 can	6 cans	11.80	_____ per can
Tomato puree	#10 can	6 cans	10.70	_____ per can
Veal leg, boned	1 lb		1.73	

100

ASSIGNMENT B:

Fill in the missing amounts on cards #1 through #10 and compute the cost per portion of each item. (For all liquids, assume that 1 lb. equals 1 pint.)

(1)

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Spaghetti sauce Yield: 150 Portion Size: 6-oz ladle	
Ingredients	Quantity	Market Price	Extension
Oil, salad	3 pints		
Onions	3 lbs		
Tomatoes	8 #10 cans		
Tomato Puree	1 #10 can		
Parsley	1 cup	. . . . .	.22
Parmesan cheese	2 lbs		
Basil	4 T	. . . . .	.10
Sugar	1 cup		
Garlic powder	4 t	. . . . .	.08
Beef base	1 cup		
		Total cost	
Date prices computed:		Cost per portion	

(2)

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Meatballs Yield: 150 meatballs Portion Size: 2 2-oz meatballs	
Ingredients	Quantity	Market Price	Extension
Ground beef	30 lbs		
Bread crumbs	3 lbs		
Eggs	16		
Milk	3 cups		
Garlic powder	2 t	. . . . .	.04
Onions, minced	1 lb		
Parmesan cheese	2 cups (½ lb)		
		Total cost	
Date prices computed:		Cost per portion	

101

(3)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Peach crisp
Yield: 50
Portion Size: 4-oz serving

Ingredients	Quantity	Market Price	Extension
Brown sugar	2 lbs		
Flour	2 lbs		
Butter	1½ lbs		
Peaches	2 #10 cans		
Ginger	4 t	. . . . .	.05
Almond extract	4 t		
		Total cost	
Date prices computed:		Cost per portion	

(4)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Beef Rouladen
Yield: 20 portions
Portion Size: 2 2-oz rolls

Ingredients	Quantity	Market Price	Extension
Bottom round	5 lbs		
Bacon	1 lb		
Ham	½ lb		
Hamburger	¼ lb		
Onion, chopped	1 cup (6oz weight)		
Eggs	4		
Bread crumbs, dry	1½ pt (14 oz)		
Sweet pickles	20		
Red wine	1 cup	. . . . .	.25
Tomato puree	1 cup	. .	
Brown sauce	2 qts	. . . . .	.45
Garlic	3 cloves	. . . . .	.10
		Total cost	
Date prices computed:		Cost per portion	

102

111

(5)

STANDARD RECIPE COST CONTROL FORM	Recipe Item: Chicken-noodle soup
	Yield: 50
	Portion Size: 6 – 7-oz

Ingredients	Quantity	Market Price	Extension
Celery	1 stalk		
Onions	1½ lb		
Carrots, raw	2 lbs	.19/lb	
Chicken base	¾ lb		
Noodles	1½ lbs		
Oil, salad	4 oz		
Water	3 gals		
		Total cost	
Date prices computed:		Cost per portion	

(6)

STANDARD RECIPE COST CONTROL FORM	Recipe Item: Arroz con pollo
	Yield: 4 portions
	Portion Size: ½ chicken

Ingredients	Quantity	Market Price	Extension
Broiler or fryer	2 2-lb chickens		
Olive oil	1/3 cup		
Onions	1 (1/3 lb)		
Green pepper	1 medium		
Garlic	1 clove	. . . . . .	.03
Chicken stock (from base)	12 oz	. . . . . .	.20
Raw rice	1 cup (½ lb)		
Tomatoes, canned	1 pint		
Pimentos	½ can		
Saffron	1/8 t	. . . . . .	.05
Peas	4 oz		
		Total cost	
Date prices computed:		Cost per portion	

(7)

STANDARD RECIPE COST CONTROL FORM	Recipe Item: Lobster Newburg
	Yield: 48 portions
	Portion Size: 4 oz

Ingredients	Quantity	Market Price	Extension
Cooked lobster meat	12 lbs		
Butter	1 lb		
Paprika	3 T	. . . . .	.05
Dry sherry	6 oz	. . . . . .	.40
Lemon juice	1 lemon		
Medium cream sauce	2 gal	1.95 per gal	
Salt and pepper	to taste		
		Total cost	
Date prices computed:		Cost per portion	

(8)

STANDARD RECIPE COST CONTROL FORM	Recipe Item: Minestrone soup
	Yield: 50
	Portion Size: 4-oz ladle

Ingredients	Quantity	Market Price	Extension
Beef base	¾ lb		
Oil	1 cup		
Onions	1 lb 8 oz		
Celery	1 lb	. . . . .	.20
Carrots	1 lb	. . . . .	.15
Peppers	2 med		
Cabbage	1 lb	. . . . .	.24
Garlic powder	1 t	. . . . .	.02
Tomatoes	1 qt		
Basil	1 t	. . . . .	.01
Parmesan cheese	1 c (4oz weight)		
Parsley	2 t	. . . . .	.02
Kidney beans	½ #10 can		
String beans	½ #10 can		
Water	2 ½ gal		
		Total cost	
Date prices computed:		Cost per portion	

(9)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Veal scalloppine
Yield: 6 portions
Portion Size: 4 oz

Ingredients	Quantity	Market Price	Extension
Veal, leg, boneless	1½ lb		
Salt and pepper	to taste	. . . . . .	--
Flour	as needed	. . . . . .	--
Butter	3 oz		
Marsala wine	½ c	. . . . . .	.15
Lemon juice	½ lemon		
Brown sauce	½ c	. . . .	.03
Mushrooms	½ lb		
		Total cost	
Date prices computed:		Cost per portion	

(10)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Pumpkin pie filling
Yield: 4 10″ pies
Portion Size: 8 per pie

Ingredients	Quantity	Market Price	Extension
Brown sugar	10 oz		
White sugar	10 oz		
Cinnamon	4 t	. . . . . .	.07
Corn starch	1 oz		
Ginger	2¼ t	. . . . . .	.04
Salt	2½ t	. . . . . .	.01
Pumpkin	4 lbs 2 oz	.12/lb	
Eggs	2 cups	.53/lb	
Milk	1¼ qts		
Molasses	¼ c	. . . . . .	.15
		Total cost	
Date prices computed:		Cost per portion	

105

114

Assignment C:
Complete the unit price for each item in the chart below.

Bakeshop Ingredients Price List

Item	Amount Purchased	Price	Unit Price
Apple filling	#10 can (7 lb) (6 to a case)	$21.84	_____ per lb
Baking powder	10-lb can	3.75	_____ per oz
Baking soda	24 1-lb cans	6.54	_____ per oz
Chocolate chips	10-lb box	16.50	_____ per lb
Cinnamon	5-lb box	15.00	_____ per oz
Cocoa	2. 10-lb boxes	12.00	_____ per lb
Eggs, fresh whole	30-lb can	15.90	_____ per lb
Eggs, frozen	30-lb can	17.40	_____ per lb
Egg whites	10-lb can	3.80	_____ per lb
Flavor	1-gal jug	2.95	_____ per oz
Flour, bread or patent	100-lb bag	14.80	_____ per lb
Flour, clear	100-lb bag	14.50	_____ per lb
Flour, high-gluten	100-lb bag	15.65	_____ per lb
Flour, pastry	100-lb bag	16.75	_____ per lb
Flour, silk-tex	100-lb bag	15.25	_____ per lb
Margarine	50-lb cube	16.50	_____ per lb
Milk, non-fat dry powder	50-lb bag	35.60	_____ per lb
Puff Do	30-lb box	19.50	_____ per lb
Salt	100-lb bag	5.00	_____ per lb
Shortening, high-ratio	50-lb cube	33.00	_____ per lb
Shortening, Nutex (liquid)	5-qt cans (Case of 6)	38.80	_____ per qt
Shortening, regular	50-lb cube	32.50	_____ per lb
Sugar, brown	100-lb bag	30.70	_____ per lb
Sugar, confectionery (6X)	100-lb bag	20.75	_____ per lb
Sugar, granulated	100-lb bag	19.75	_____ per lb
Vanilla (imitation)	1-gal jug	4.25	_____ per oz
Yeast	1-lb block	.35	_____ per lb

ASSIGNMENT D:

Using the table on the previous page, fill in the missing amounts on cards #11 through #20 and compute the cost per portion of each item.

(11)

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Spritz cookies Yield: 12 lbs — 280 cookies Portion Size:	
Ingredients	Quantity	Market Price	Extension
Granulated sugar	2 lbs		
Shortening	5 lbs		
Salt	1 oz		
Egg whites	1 lb		
Vanilla	1 oz		
Patent flour	5 lbs		
		Total cost	
Date prices computed:		Cost per pound	

(12)

STANDARD RECIPE COST CONTROL FORM		Recipe Item: White bread Yield: 24 Portion Size: 14 oz	
Ingredients	Quantity	Market Price	Extension
Salt	4 oz		
Granulated sugar	1 lb		
Milk powder	1 lb		
Regular shortening	1 lb		
Cold water	8 lbs		
Yeast	1 lb		
Patent flour	15 lbs		
		Total cost	
Date prices computed:		Cost per loaf	

107

(13)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Puff pastry
Yield: 18 lbs – 115 pieces
Portion Size: 2½ oz

Ingredients	Quantity	Market Price	Extension
Bread flour	10 lbs		
Salt	2 oz		
Water	6 lbs		
Puff-Do	5 lbs		
		Total cost	
Date prices computed:		Cost per piece	

(14)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Gingerbread
Yield: 21 lbs – 134 pieces
Portion Size: 2½ oz

Ingredients	Quantity	Market Price	Extension
Brown sugar	3 lbs		
Granulated sugar	3 lbs		
Margarine	3 lbs		
Spices (Use cinnamon)	2¾ oz		
Baking soda	½ oz		
Whole eggs, frozen	1 lb		
Pastry flour	10 lbs		
Baking powder	2½ oz		
Water	1 lb		
		Total cost	
Date prices computed:		Cost per piece	

(15)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Topping for Sour-Cream loaf
Yield: 20 toppings
Portion Size: ¼ lb.

Ingredients	Quantity	Market Price	Extension
Granulated sugar	3 lbs		
Water	1 lb		
Chocolate chips	1 lb		
Cinnamon	1 oz		
Cocoa	1 oz		
		Total cost	
Date prices computed:		Cost per topping:	

(16)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Pizza Dough
Yield: 8 pies
Portion Size: 9 oz

Ingredients	Quantity	Market Price	Extension
High-gluten flour	3 lbs		
Water	8 oz		
Yeast	3 oz		
Granulated sugar	6 oz		
Regular shortening	7 oz		
		Total cost	
Date prices computed:		Cost per pie:	

(17)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Butter cream
Yield: 30 lbs
Portion Size:

Ingredients	Quantity	Market Price	Extension
High-ratio shortening	5 lbs		
Salt	2 oz		
Milk powder	1 lb 4 oz		
Water	3 lbs 8 oz		
Vanilla	1 oz		
Confectionery sugar	20 lbs		
		Total cost	
Date prices computed:		Cost per pound :	

(18)

STANDARD RECIPE COST CONTROL FORM

Recipe Item: Bun dough
Yield: 35 lbs — 280 pieces
Portion Size: 2 oz

Ingredients	Quantity	Market Price	Extension
Sugar	4 lbs		
Salt	4 oz		
Margarine	4 lbs		
Patent flour	12 lbs		
Pastry flour	6 lbs		
Dry milk	1 lb		
Whole eggs, fresh	3 lbs		
Yeast	2 lbs		
Flavor	1 oz		
Water	8 lbs		
		Total cost	
Date prices computed:		Cost per piece:	

110

(19)

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Windsor cake Yield: 78 Portion Size: 7" cake	
Ingredients	Quantity	Market Price	Extension
Cake flour (High-gluten)	10 lbs		
Nutex shortening	7 lbs		
Granulated sugar	12 lbs 8 oz		
Salt	6 oz		
Baking powder	10 oz		
Milk powder	14 oz		
Whole eggs, fresh	9 lbs		
Flavor	6 oz		
Water	4 lbs 10 oz		
		Total cost	
Date prices computed:		Cost per cake:	

(20)

STANDARD RECIPE COST CONTROL FORM		Recipe Item: Pie crust Yield: 120 single crusts Portion Size:	
Ingredients	Quantity	Market Price	Extension
Pastry flour	10 lbs		
Regular shortening	7 lbs		
Cold water	3 lbs 8 oz		
Salt	5¾ oz		
		Total cost	
Date prices computed:		Cost per crust	

Lesson 1   Making Change

Objectives: You will learn 'the importance of giving out the correct change.
                You will practice giving out change.
                You will learn how to use the cash register.

Related Information:

        Depending upon the size of the restaurant, you may find yourself in the position
of having to operate the cash register; you may also give change to customers as a waiter
or waitress. In a previous unit you practiced filling out a guest check. Some waiters are
required to fill out the guest check, and in some cases they take the money to the
register for the customer.

THE CASH REGISTER

        The cash register provides safe storage for money taken in, as it can be locked. It
also, if used properly, keeps the money sorted in proper denominations (dollar bills,
five-dollar bills, 10-dollar bills, nickels, dimes, etc.) making it easy to make change.

        Through use of a tape, the cash register keeps a record of the cash received and
paid out. Money is generally not left overnight in the register, even though it can be
locked.

        A register report is generally filled out. It records all the money placed into the
register in the morning. At the end of the day a total is made of the amount of money
in the register.

Example: Cash put into register: $ 20.00

                Cash at the end of the day: $500.00

        ✓   Actual cash received: $500.00 – $20.00 = $480.00

        The printed amount on the tape is compared with the actual amount in the
drawer.

        If the two are the same, everything is correct.

        If there is more actual cash than there should be, the register is said to be *over*.
The cashier probably did not pay out enough money in making change.

        If there is less actual cash in the register than on the tape, the register is said to
be *short*. Again an error has been made: not enough money was taken in, or too much
was paid out.

112

To prevent errors, you must: *Know how* to operate your register properly.

Be *accurate in operating* the machine.

Be *careful in handling* the money.

An experienced operator puts the bill received on the plate in front of the register. This will prevent a customer from making an erroneous claim, and will also prevent the operator from forgetting the amount received.

When the customer is given change, state out loud the amount of the sale. Then start with the smallest denomination and count off the change until it equals the amount of the bill still visible on the register. This bill is then placed properly in the drawer.

ASSIGNMENT, Part A:

1. Write the following in words:

   a. $5.68 _____

   b. $0.19 _____

   c. 45¢ _____

   d. $1.09 _____

   e. $25.89 _____

   f. $124.83 _____

2. Express in figures:

   a. three hundred and seventeen _____

   b. eighteen dollars and sixty-three cents _____

   c. thirty-three dollars and six cents _____

   d. fifty-one dollars and twelve cents _____

   e. two dollars and seventy-seven cents _____

3. Change the following amounts to dollars and cents:

   a. 10 nickels = $. ____

   b. 12 dimes = $. ____

   c. 4 quarters = $. ____

   d. 25 nickels = $. ____

   e. 10 quarters = $. ____

   f. 18 dimes = $. ____

113

4. Give the proper amount of change for the following:

   a. Amount of check $2.75; amount of money given: $5.00   _____

   b. Amount of check $3.06; amount of money given: $5.00   _____

   c. Amount of check $1.34: amount of money given: $2.00   _____

   d. Amount of check $4.67; amount of money given: $10.00   _____

   e. Amount of check $12.19; amount of money given: $20.00   _____

   f. Amount of check $8.98; amount of money given: $20.00   _____

   g. Amount of check $ 2.78: amount of money given: $20.00   _____

   h. Amount of check $7.54; amount of money given: $10.00   _____

   i. Amount of check $.65; amount of money given: $1.00   _____

   j. Amount of check $1.06; amount of money given: $2.00   _____

ASSIGNMENT, Part B:

Example: You sold a $1.35 lunch and received $5.00 from the customer. Tell how
             you would give the customer change.

             Always use the largest possible cash and coins when making change.
             Always start with the amount of the sale and give the change back starting
             with the lowest coin first.

             The answer to the above problem would be: Say: $1.35.....1.40 (a nickel),
             1.50 (a dime), 1.75 (a quarter) 2 dollars (another quarter), three, four,
             five dollars (three 1-dollar bills).

1. You sold a 65¢ lunch and received $1.00.

2. You sold a $1.30 lunch and received a $10.00 bill.

3. Fill out the chart on the following page. Use a check mark (✓) for each coin.

123

	Amount of Sale	Amount Received	Coins					Bills			
			1¢	5¢	10¢	25¢	50¢	$1	$5	$10	$20
1.	$ 1.25	$ 2.00									
2.	.77	$ 1.00									
3.	$ 2.50	$ 5.00									
4.	$ 4.07	$ 5.00									
5.	$11.75	$15.00									
6.	$11.75	$20.00									
7.	$11.75	$12.00									
8.	$ 1.98	$ 5.00									
9.	$ 6.67	$10.00									
10.	$ 5.17	$ 6.00									
11.	$23.83	$25.00									
12.	$ 4.32	$20.00									
13.	$ 3.79	$10.00									
14.	.65	$10.00									
15.	$13.33	$15.00									
16.	$12.33	$20.00									
17.	$ 9.08	$20.00									
18.	$ 8.01	$20.00									

124

THE CASH REGISTER REPORT FORM

The instructor will explain how to fill out the cash-register report form by projecting a transparency of the form in this book.

The BEFORE column shows the different denominations of coins and cash that were received and placed in the register when it was first opened. These are totaled up below each section, and the full total is entered below, as "Total all money in the register."

The AFTER is done the same way, listing the amounts of each coin and cash and totaling up each section. The total "before" is subtracted from the total "after" to get the "actual cash taken in" for the day.

ASSIGNMENT C:

1. Do this one with the instructor:

    Before: 20 — 1¢; 20 — 5¢; 10 — 10¢; 8 — 25¢; 5 — $1.00; 1 — $5.00

    After: 8 — 1¢; 36 — 5¢; 14 — 10¢; 8 — 25¢; 37 — $1.00; 13 — $5.00;
    1 — $10.00

2. Do these register reports yourself:

    a. Before: 20 — 1¢; 20 — 5¢; 10 — 10¢; 8 — 25¢; 5 — $1.00

        After: 4 — 1¢; 9 — 5¢; 31 — 10¢; 27 — 25¢; 37 — $1.00; 13 — $5.00;
        7 — $10.00

    b. Before: 50 — 1¢; 40 — 5¢; 20 — 10¢; 16 — 25¢; 10 — $1.00; 2 — $5.00

        After: 35 — 1¢; 12 — 5¢; 18 — 10¢; 4 — 25¢; 76 — $1.00; 4 — $5.00;
        2 — $10.00; 2 — $20.00

125

CASH REGISTER REPORT

Name: _____ Date: _____

Quantity	BEFORE Coin	Amount	Quantity	AFTER Coin	Amount
	1¢			1¢	
	5¢			5¢	
	10¢			10¢	
	25¢			25¢	
Total of coins =			Total of coins =		

Quantity	Bills	Amount	Quantity	Bills	Amount
	$ 1.00			$ 1.00	
	$ 5.00			$ 5.00	
	$10.00			$10.00	
	$20.00			$20.00	
	Other			Other	
Total of cash			Total of cash		
Total of coins from above			Total of coins from above		
Total all money in register			Total all money in register		

Cash in register AFTER   _____
Cash in register BEFORE _____
Actual cash taken in   _____
Reading on tape   _____
Amount   short   _____
         over   _____

Signed _____

Approved _____

126

CASH REGISTER REPORT

Name: _____ Date: _____

Quantity	BEFORE Coin	Amount		Quantity	AFTER Coin	Amount
	1¢				1¢	
	5¢				5¢	
	10¢				10¢	
	25¢				25¢	
Total of coins =				Total of coins =		

Quantity	Bills	Amount		Quantity	Bills	Amount
	$ 1.00				$ 1.00	
	$ 5.00				$ 5.00	
	$10.00				$10.00	
	$20.00				$20.00	
	Other				Other	
Total of cash				Total of cash		
Total of coins from above				Total of coins from above		
Total all money in register				Total all money in register		

Cash in register AFTER _____

Cash in register BEFORE _____

Actual cash taken in _____

Reading on tape _____

Amount short _____

over _____

Signed _____

Approved _____

127

CASH REGISTER REPORT

Name: _____ Date: _____

Quantity	BEFORE Coin	Amount	Quantity	AFTER Coin	Amount
	1¢			1¢	
	5¢			5¢	
	10¢			10¢	
	25¢			25¢	
Total of coins =			Total of coins =		

Quantity	Bills	Amount	Quantity	Bills	Amount
	$ 1.00			$ 1.00	
	$ 5.00			$ 5.00	
	$10.00			$10.00	
	$20.00			$20.00	
	Other			Other	
Total of cash			Total of cash		
Total of coins from above			Total of coins from above		
Total all money in register			Total all money in register		

Cash in register AFTER _____
Cash in register BEFORE _____
Actual cash taken in _____
Reading on tape _____
Amount short _____
over _____

Signed _____

Approved _____

128

Lesson 2   **Reading and Writing Decimals**

Objective::   You will learn how to read and write decimals.

Related Information:

In Unit II we studied fractions. A fractions is *less than a whole thing. It is also possible to express less than a whole thing by the use of decimals.* Usually it is easier to work with decimals than with fractions – except for the simplest fractions. When we convert to the metric system, we will be using decimals most of the time. At present, your chief use for decimals will be in dealing with money.

We use the word "decimal," but what we mean is "decimal fraction." A *decimal fraction* is a fraction whose denominator is 10, 100, 1000, etc.

For example, look at the number 57.45

The 57 represents the whole number

The numbers to the *right* of the decimal point (in this case 45) mean that we have more than 57, but not enough to make 58.

We could also express the above amount this way:

$$57\frac{45}{100}$$

You must memorize the following table in order to properly read and write decimals.

One place (number) is read as *tenths:*   .05 is five tenths ($\frac{5}{10}$)

Two places (numbers) is read as *hundredths:*   .05 is five hundredths ($\frac{5}{100}$)

Three places (numbers) is read as *thousandths:* .005 is five thousandths ($\frac{5}{1000}$)

Four places (numbers) is read as *ten thousandths:*   .0005 is five ten-thousandths ($\frac{5}{10,000}$)

How To Read Decimals:

Read the number to the left of the decimal point as you would any whole number. Follow this example:

247.89

129

Say *"Two hundred forty-seven..."*

Read the decimal point by saying "and":

"Two hundred forty-seven *and...*"

Read the number to the right of the decimal point normally:

"Two hundred forty-seven and *eighty-nine...*"

Complete the statement by counting the number of places to the right of the decimal point. In this case the two digits, 8 and 9, take two places. Therefore (check your chart for two places)....

You add the words "hundredths."

247.89 The complete statement:

"Two hundred forty-seven and eighty-nine hundredths."

Don't get fooled by zeros!

.09   Say the number: *"nine."* Count the places...two.

Complete the statement..."nine *hundredths."*

.9   Say the number *"nine."* Count the places...one.

The number is "nine *tenths."*

.909   Say the number *"nine hundred nine."* Since there are three places, add *"thousandths."*

Note: A zero at the *right* end of the decimal does not change the *value* of the number. But you should read it as if it were any other digit.
For example: .50 and .500 and .5000 mean the same as .5 for computation purposes,
but should be read as "fifty hundredths," "five hundred thousandths," and "five thousand ten-thousandths."

ASSIGNMENT:

A. Write the following in word form: (Use the word "and" only to show the decimal point. For example, 702.207 is read "seven hundred two and two hundred seven thousandths.")

1. .4 _____

2. .10 _____

3. .04 _____

4. 14 _____

5. 1.4 _____

130

6. .14 _____
7. 1.14 _____
8. 14.14 _____
9. 104.104 _____
10. 114.004 _____
11. .86 _____
12. .0009 _____
13. 6.060 _____
14. 60.06 _____
15. 60.60 _____
16. 323.002 _____
17. 17.107 _____
18. 21.758 _____
19. 23.9001 _____
20. 2,045.91 _____

B. Write the following as decimal fractions

1. Eight tenths _____
2. Eight hundredths _____
3. Eight and eighty hundredths _____
4. Sixty-three and forty-nine thousandths _____
5. Sixteen and six thousandths _____
6. Five hundred seven and five tenths _____
7. Two and seven hundredths _____
8. Ninety-four thousandths _____
9. Eight hundred forty-seven _____
10. One thousand nine and eighty-four hundredths _____

131

Objectives: You will learn how to round off decimals.

Related Information:

When working with numbers we are often left with more numbers than we need for a correct and accurate answer. It is necessary to eliminate some of these numbers. For that reason we shall practice rounding off numbers again — this time decimals.

$$
\begin{array}{r}
\$140.68 \\
\times \quad .12 \\
\hline
28136 \\
14068 \\
\hline
\$16.8816
\end{array}
$$

In the above multiplication problem our answer comes out $16.8816. The smallest coin we have is a penny. When we pay a bill, for example, we cannot pay someone $.8816. We can pay $.88 (88¢) or $.89 (89¢). The 16 must be removed for almost all purposes.

There are certain rules we must follow in rounding off decimals. They are mostly the same rules we followed in rounding off whole numbers.

In some problems you will be told how far to round off. In dealing with money, however, without being told, we normally round numbers off to the nearest cent, as explained above (to two places).

RULE A: If the digit to be dropped is 5 or more (5, 6, 7, 8, 9), *increase the number before it* by 1.

RULE B: If the digit to be dropped is 4 or less (4, 3, 2, 1, 0), *do not increase the number before it.*

Example 1: $34.652   We wish to round this amount off to the nearest cent (two decimal places). We want to drop the 2.

                        The 2 we wish to drop is less than 5 (rule B above), so we drop it *without* changing the 5 in front of it.

        $34.65   The amount becomes $34.65

Example 2: $208.385   We wish to round off this number to the nearest cent   (two decimal places).

                        The number to be dropped is 5. As indicated by rule A, we must add 1 to the preceding number. The 8 is therefore changed to 9.

        $208.39   The amount becomes $208.39

123

ASSIGNMENT:

A. Find the following correct to the nearest cent:

1. $.2658 _____	6. $145.032 _____	11. $5.999 _____
2. $.09 _____	7. $6.001 _____	12. $41.1278 _____
3. $1.108 _____	8. $.009 _____	13. $1489.4549 _____
4. $12.2349 _____	9. $435.892 _____	14. $32.095 _____
5. $.829 _____	10. $32.297 _____	15. $3.9978 _____

B. Find the following correct to the nearest tenth:

1. .37 _____	6. 1.92 _____	11. 6.975 _____
2. .289 _____	7. 3.74896 _____	12. 2.0495 _____
3. .8 _____	8. 2.38 _____	13. .996 _____
4. .16 _____	9. 5.06 _____	14. 13.95 _____
5. 3.11 _____	10. .90 _____	15. 7.0499 _____

C. Find the following correct to the nearest hundredth:

1. .321 _____	5. .320 _____	9. 399.7049 _____
2. .2048 _____	6. 39.15932 _____	10. 5.9965 _____
3. .289 _____	7. 2.904 _____	11. 3.0019 _____
4. 4.845 _____	8. 15.29567 _____	12. .009 _____

D. a. What is the difference in meaning between the following numbers?

35   35.0   35.00

35 could stand for any number between 34.5 and _____

35.0 could stand for any number between 34.95 and _____

35.00 could stand for any number between 34.995 and _____

b. Which of the above three numbers is the most exact? _____

c. Which of these is the most exact number? _____

10.30   10.300 , 10.3

133

Example 3: $208.3845   We wish to round off this number to the nearest cent or two decimal places.

Now look at the digits after the 38. There are two: 4 and 5. *The only digit we are concerned with is the one* immediately after *the digit in the cents place.* This is a 4. By rule B above, since it is less ₊than 5, we drop it (and any others) without changing the preceding 8.

$208.38   The amount becomes $208.38.

Examples: $208.3845   Drop the 45.   Answer: $208.38

$208.385   Drop the 5 but add 1 to the 8.   Ans: $208.39

$208.3865   Drop the 65 but add 1 to the 8. Ans: $208.39

$208.38358   Drop the 358.   Ans: $208.38

Correct to the nearest tenth means:

.2568   Tenth means correct to *one place.* Underline it to help you
.2 568   remember. Drop all numbers except the .2, but change the .2 to
.3   .3 because the next digit is a 5.

Correct to the nearest hundredth means:

.35843   Hundredth means *two* places to the right of the decimal.
.35 843   Underline the two places. The following digit is an 8. Therefore
.36   change the 5 in the .35 to a 6.

Correct to the nearest thousandth means:

23.15432   Thousandth means *three* places. Underline the three places if it
23.154 32 will help you₊ The following digit is a 3. Therefore the last two
23.154   digits (32) are dropped.

Correct to the nearest whole number means:

23.41   Drop all numbers to the right of the decimal point. Also drop
          the decimal point itself.
23   The correct answer is 23.

Note: When you need an answer correct to a certain place, always give that place its digit even if it is a zero.

Example: Round off 2.97 correct to the nearest tenth.

Since the digit in the next place is a 7, you must raise the preceding digit, 9, by 1. Raising 9 by 1 gives 10. So in order to raise the 9, we have to carry the 1 to the next place. We get 3.0 as the answer. We do *not* drop the zero if we have been asked to give an answer correct to *the nearest tenth.* The zero *shows that* the answer is correct to the nearest tenth, and not to the nearest whole number.

The same number, 2.97, correct to the nearest whole number, would be simply 3.

125

Lesson 4   Addition and Subtraction of Decimals

Objective: You will review the addition and subtraction of decimals.

Related Information

You have been using decimals from the first chapter in this book. Any time you work with money you have to concern yourself with decimals. The rule for addition and subtraction of decimals is simple: *The decimal points must be kept in a straight column, each one decimal point right under the other.*

Example: Add the following numbers: .189 + .905 + .45 + .34.908

$$
\begin{array}{r}
.189 \\
.905 \\
.45 \\
\underline{34.908}
\end{array}
$$
Note how the decimal points are lined up.

$$
\begin{array}{r}
.189 \\
.905 \\
.450 \\
\underline{34.908}
\end{array}
$$
It may help to keep your columns straight if you add zeros. All the numbers have 3 places except the .45. Add a 0 to make that a 3-place number also. It does not affect its value. Now add.

Example: Subtract 145.89 from 457.03

$$
\begin{array}{r}
457.03 \\
-\,145.89 \\
\hline
\end{array}
$$
Note how the decimal points are lined up.

Subtract as you would in any subtraction problem.

Example: Subtract .43 from 890

$$
\begin{array}{r}
890. \\
-\quad .43 \\
\hline
\end{array}
$$
The 890 does not show a decimal point, but being a whole number it has the decimal point understood after the 0 in the 890. The number 890 is the same as 890.

$$
\begin{array}{r}
890.00 \\
-\quad .43 \\
\hline
\end{array}
$$
We then add two more zeros to make the numbers line up and easier to subtract.

ASSIGNMENT:

A. Arrange the following numbers in columns and add. *After you have added,* round off the answer correct to the nearest hundredth.

1. 7.026 + 4.495 + 117.02 + 65.17   _____ _____

2. 3.507 + 33.08 + 2.1 + 4.009 + 35   _____ _____

3. .005 + 105.75 + 178.2 + 143 + 110.728   _____ _____

135

4. $325.07 + $10.04 + $.23 + $1.45 + $1000.00 _____ _____

5. 5.0245 + .07 + 14.2003 + 4.2 _____ _____

6. $5.34 + $1.06 + $45.90 + .99 _____ _____

B. Arrange the following and subtract. *After you have subtracted,* round off your answer correct to the nearest tenth.

1. 306.6 − 32.9 _____ _____

2. 205.06 − 140 _____ _____

3. 302.09 − 215.387 _____ _____

4. 35.613 − 7.475 _____ _____

5. 78.5137 − 59.306 _____ _____

C. Add the following:

1.	2.	3.	4.
1.25	1.8	.379	24.056
57.	2.6	2.05	18.287
.32	.759	.876	.94
.18	.375	.91	7.876
48.	1.48	.8	.093

D. Subtract the following:

1. $101.76	2. $92.65	3. $64.57	4. $843.72
− 43.25	− 1.97	− 27.85	− 81.56

5. $587.24	6. $845.27	7. $1,276.35	8. $671.19
− 218.78	− .97	− 145.18	− 98.07

E. Word Problems:

1. The Acme restaurant had the following overhead expenses for the month: electricity $143.67, heat $137.50, gas $45.07, insurance $150.00, rent $900.00. What did the overhead expenses total? _____

2. The Hut restaurant placed an order for the following items: 1 cook's knife $6.95, 1 dozen serving trays at $16.80 a dozen, 1 5-qt soup tureen at $4.95, 1 ingredient bin at $46.00. What did the order total? _____

3. Howard's restaurant ordered the following items: 1 32-gallon trash can $8.95, 1 roll clear vinyl seal-wrap $6.95, 1 case sani-liners $11.05 per case, 1 tray-stand $5.75. What did the bill total? He returned the tray stand because it was defective. What was the final bill? _____

127

4. The Steak Pub received an estimate on the following items:

   2-compartment kitchen sink $145.00
   1 deep-fat fryer $295.00
   1 stainless-steel-top worktable $198.50
   1 electric dishwasher $1,465

   What was the total on the estimate? _____

F. Can you figure out why you do *not* round off figures *before* adding or subtracting them?

Objectives: You will review the rules pertaining to multiplication of decimals.
                You will understand the importance of multiplication of decimals in food
                service.

Related Information:

        Wherever money is used, it is necessary to know how to multiply decimals. When
multiplying decimals, it is *not* necessary for the decimal points to line up vertically (as it
is in addition and subtraction).

        Example: (a.)   479.84   or (b.)   34.7984
                        X   8.01   X   8.5

Step 1: Multiply as you would in any multiplication problem.

Step 2: Count the total number of decimal places in the numbers being multiplied.

        In example (a) above, there are two decimal places in the first number (.84);
        there are two decimal places in the second number also (.01). Two places plus
        two places equals four places. Our answer then will have to have four decimal
        places.

                    479.84
                X   8.01
                ─────────
                    47984
                 3838720   Count four places from the right and put in the
                ─────────   decimal point.
                3843 5184
                    ʌ

        In (b) above, without even multiplying, we can see that we will have to count
        five places from the right in our answer to place the decimal point.

        We can expect that almost everyone will own one of the mini-computers in the
near future, making all math work easier. Even with computers, however, we must know
how to set up the problems and how to interpret the answers. Many restaurants provide
waitresses with adding machines to make their work easier, faster, and more accurate.

Note: We call the first number the multiplicand: 2.45
         and the second number the multiplier: X 2.4
         and the answer is called the product: 5.880

         When numbers are to be multiplied, it does not matter which one you make the
         multiplier and which the multiplicand: 3 X 2 is the same as 2 X 3. It is
         usually easier to multiply by the smaller number in problems such as the ones in
         part A of the assignment.

129

ASSIGNMENT:

A. Multiply the following:

1. 909.50 X 73 _____

2. 45.3 X 2.4 _____

3. 804.3 X .7 _____

4. .0075 X 4.23 _____

5. .24 X 78.5 _____

6. $300.45 X 36 _____

B. Complete the following:

1. 5.724 X 28 _____

2. 847.3 X .46 _____

3. .083 X 1.54 _____

4. 5.042 X 8.1 _____

5. Two scales were ordered at $13.50 a scale. What was the total cost? _____

6. What did the bill come to if fiberglass trays cost $19.80 a dozen and twelve dozen were ordered? _____

7. What is the cost of 5 plastic washing machine racks at $11.95 a rack? _____

8. Condiment holders with a gold finish cost $2.40 each. How much would it cost the cafeteria to order one for each table? There are 28 tables. _____

9. What would it cost to replace all the seats in the cafeteria if one fiberglass stack chair costs $11.95? There are 224 seats in the cafeteria.

139

10. WAGE PROBLEMS. Find the gross pay for:

a.   40 hours at $2.20 per hour   _____

b.   40 hours at $2.45 per hour   _____

c.   36 hours at $1.95 per hour   _____

d.   30 hours at $3.40 per hour   _____

e.   15 hours at $2.60 per hour   _____

11. COMPUTING COSTS:

Sometimes costs per portion of an item are very small. These must still be calculated because, when making hundreds of portions, they "add up." After completing the multiplication of the following problems, don't forget to round off to two places. We usually consider costs to the nearest whole cent.

a.   17 servings at 0.125 per serving   _____

b.   150 pork chops at .6375 per serving   _____

c.   50 bowls of soup at .0572 per serving   _____

d.   74 portions of pie at 0.183 per piece   _____

e.   200 portions at .855 per portion   _____

f.   350 portions at $1.245 per portion   _____

g.   75 portions at .65 per portion   _____

140

Objective: You will practice filling in two forms used in the foods trade – the inventory list and the stock record card.

Related Information:

Keeping a proper inventory is a necessary part of the management of any food-service establishment. An inventory is a list of all the items on hand. The inventory may involve every single item in the restaurant – chairs, tables, ovens, food, etc., but we are interested here in the inventory of stores only.

The cook must have the necessary supplies on hand when he or she prepares the food. The cook must depend on the storeroom's having certain items in stock all the time. Other items he knows he must order for special occasions such as banquets, parties, or holiday occasions.

The inventory may be done DAILY, WEEKLY, SEMIMONTHLY, or MONTHLY. A *perpetual inventory* means that every time an item is put into stores or taken out, it is recorded or an adjustment is made on an inventory card or sheet.

The month-end inventory is most important. Food costs cannot be accurately calculated without accurate inventories on what is *actually* used each month.

ASSIGNMENT A:

On the next page is an example of part of an inventory taken by a worker in a restaurant. Following the instructions given, find the unit price of each food and the extension.

To find the "extension" –

If 6 cans of potato granules cost $11.64, find the price of 1 can by dividing 6 into $11.64. This gives you the *unit* price.

Multiply the unit price by the quantity on the shelf – 7 cans – to find the extension.

Add all the extensions to find the grand total of all items.

(B) Assuming 25 portions per No. 10 can on the desserts (fruits), are we able to feed 300 students with each item? If not, which one(s) are we short of?

141

INVENTORY

DATE TAKEN _____   Page # _____

INVENTORY BY_

Qty.	Size	Food	Packed	Price Per Package		Unit Price	Extension
7	#10 can	Potato granules	6	11	64	1.94	13.58
7	#10 can	Pork and beans	6	8	19		
12	3 lb	Peanut butter	6	12	80		
4	66 oz	Solid light tuna	6	32	74		
8	#10 can	Catsup	6	10	93		
8	#10 can	Peas	6	7	95		
2	#10 can	Mixed Vegetables	6	8	38		
3	#10 can	Cut wax beans	6	8	00		
8	#10 can	Potatoes	6	7	70		
4	#10 can	Peaches	6	11	83		
13	#10 can	Fruit mix	6	12	27		
17	#10 can	Sauerkraut	6	6	67		
5	#10 can	Pear halves	6	12	66		
5	#10 can	Chow mein noodles	6	6	63		
6	#10 can	Cherry filling	6	17	05		
17	1 lb can	Mushrooms	24	27	87		
22	21 oz	Ajax	30	5	55		
					Total this page		

133

STOCK RECORD CARD

The stock record card is useful in checking and controlling inventories in the storeroom. In large storerooms it is useful because:

1. It indicates the LOCATION of the food items.
2. It indicates the SIZE of the item: #10 can, or #5 can, etc.
3. HIGH LIMIT and LOW LIMIT: This gives the storeroom attendant, manager, or purchasing agent an idea of how many to order. He knows he must not go over the high limit; he knows that when the number of items on the shelf gets down to the low limit, he must order.
4. DATE: self-explanatory.
5. REC'D: the number of items put into stores.
6. ISSUED: the number of items given over to the kitchen. This gives the manager an idea as to how much to keep on hand by knowing how often the item is called for.
7. BALANCE: the number of items remaining on a particular date.

A card like this requires close storeroom control. The card is useless unless each time an item is received or checked out it is recorded. Control like this would be necessary in large restaurants, dining rooms in hospitals, etc.

ASSIGNMENT C:

Make the proper entries on the STOCK RECORD CARD on the following page.

Item: Sweet peas, #10 cans, which are kept on shelf 2A. The stock is permitted to vary between 6 cans and 15 cans.

On May 1 we had 3 cans on the shelf

On May 2 we received 2 cases. During the day we issued 2 cans to the cook.

On May 4 we issued 2 cans to the cook.

On May 5 we issued 2 cans to the cook.

Is it time to reorder peas yet?

143

Stock Record Card for Inventory Control

STOCK RECORD CARD				Item:			
Location:			Size	High Limit		Low Limit	
Date	Rec'd	Issued	Balance	Date	Rec'd	Issued	Balance

144

Lesson 7   Division of Decimals

Objectives: You will review the division of decimals.
                You will practice using division in food-related problems.

Related Information:

        There are three general types of problems involving the division of decimals

        1. Dividing a whole number into a decimal: 8)7.89

        2. Dividing a decimal into a whole number: 8.8)4578

        3. Dividing a decimal into a decimal: 8.8) 234.866

BASIC RULE:
        If there is a decimal point in the divisor (the number outside the box), move
        it to the right of the last digit and count the number of places you are
        moving it. Then move the decimal point *inside* the box *the same number of
        places*.

Example 1:   8)7.89   Rule does not apply – there is no decimal point in
                              the divisor.

Example 2:   8.8)234.866   Move point in the divisor one place to the right; then
                              do the same thing to the number inside the box.

Example 3:   .880)234.866   Move point in the divisor three places to the right;
                              then do the same thing to the number inside the box.

        If there is no decimal point in the number inside the box, add a decimal point at
the end and as many zeros as necessary to permit moving the decimal point as many
places as needed.

Example 4:   8.8)4578   No decimal inside the box.

              8.8)4578.0   Since we must move the decimal point in the divisor
                              one place, add a decimal point and one zero inside the
                              box. This does not change the value of the number.

              88)45780.   Now move decimal point in the divisor and move
                              decimal point inside box, as in example 2 above.

Example 5:   8.90)234   No decimal inside box.

              8.90)234.00   Add a point and two zeros inside box.

              890)23400.   Move both decimal points

        In all these problems, we must complete the preliminaries by putting in a
decimal point for the answer. It is placed *directly above* the decimal point inside the box.

    (Ex.1) 8)7.89   (Ex.2) 88)2348.66   (Ex.3) 880)234866.   (Ex.4) 88)45780.   (Ex.5)890)23400.

Now divide as you would in any other division problem. Carry out your division to the same number of decimal places *above* the line as there are decimal places *below* the line. Then look to see whether the *next* digit would be 5 or more. If so, increase your last digit by 1.

When dealing with *money amounts*, always carry out the division to 2 places beyond the decimal point. Then go a step further to see what the next digit will be, so you can round off your answer properly.

ASSIGNMENT:

1. There are approximately 25 servings in a #10 can. Work the following problems:

a. $45.90 divided by 25   _____

b. $4.55 divided by 25   _____

c. $7.50 divided by 25   _____

d. $1.25 divided by 25   _____

e. $2.50 divided by 25   _____

f. $4.00 divided by 25   _____

g. $4.75 divided by 25   _____

h. $7.40 divided by 25   _____

i. $8.88 divided by 25   _____

j. $14.80 divided by 25   _____

k. $24.49 divided by 25   _____

l. $37.12 divided by 25   _____

146

2. a. $23.18 divided by 12 _____

   b. $14.07 divided by 6 _____

   c. $8.72 divided by 50 _____

   d. $18.97 divided by 15 _____

   e. $40.89 divided by 12 _____

   f. $2.37 divided by 100 _____

   g. $27.35 divided by 18 _____

   h. $89.09 divided by 22 _____

3. a. 82.50 divided by 1.25 _____

   b. 1.44 divided by 3.7 _____

   c. .45 divided by 15 _____

   d. 1.7243 divided by .43 _____

   e. 580.5 divided by 21.5 _____

   f. 82.614 divided by .028 _____

4. Compute the cost per serving based on the total recipe costs given:

   a. 30 portions, $4.00 _____

   b. 35 portions; $35.75 _____

   c. 20 portions; $9.309 _____

   d. 35 portions; $14.00 _____

138

e. 50 portions; $85.00 _____

f. 12 portions; $0.6552 _____

5. Compute the cost per serving, assuming 25 servings per #10 can.

a. Number 10 cans of peaches cost $10.91 per case of 6. What is the cost per can? What is the cost per serving? _____ _____

b. One case of plums costs $10.59. What is the cost per can? What is the cost per serving? _____ _____

c. One case of apricots costs $14.61. What is the cost per can? What is the cost per serving? _____ _____

d. Two cases of cherries cost $21.48. What is the cost per can? What is the cost per serving? _____ _____

6. At $9.20 per dozen, what is the cost of one 11" oval platter? _____

7. Heavy-weight 6¾-oz. cups come packed in cartons of 4 dozen. They cost $6.30 per dozen. How much does a carton cost? How much are they per cup? _____ _____

8. Large dinner plates, 10", cost $10.80 a dozen and come packed two dozen to the carton. How much is a carton? One plate? _____ _____

148

Objective: You will learn to fill out a simple requisition form.

Related Information:

You may someday be in a position where you have to order supplies. Some institutions have open orders on food items, where all you have to do is call up and order over the phone. In some restaurants the person in charge of the storeroom keeps a regular inventory, and orders as required.

Where equipment is involved, procedures may vary. In a small restaurant the boss may approve a purchase in a matter of minutes and leave the rest up to you. In some businesses, orders may have to go through many channels before being approved for purchase. Sometimes it is necessary to order equipment a year in advance, as in schools.

No matter what method your own business uses, you should know how to fill out a simple requisition form. A sample form is shown on the next page.

149

Requisition for ordering supplies outside of restaurant.

PURCHASE REQUISITION TO: PURCHASING DEPARTMENT. Please order the following:							
Vendor:						No.	
Date Ordered	Terms		F.O.B.	Ship via	Date Promised	Quotation Number	
QUANTITY	PART NO.	DESCRIPTION AND MANUFACTURER				UNIT PRICE	TOTAL PRICE
			Date of requisition		Date required		
Required for:		Requisitioned by:		Approved by			

The first five lines are usually taken care of by the purchasing department. It may have to shop around to get the items:

        a. at the best price
        b. delivered promptly
        c. from a dependable supplier

1. QUANTITY: The number of items you want.
2. PART NO: Manufacturers catalog no.
3. DESCRIPTION AND MANUFACTURER: Tell what it is you are ordering and what manufacturer you are referring to.
4. UNIT PRICE: How much one item costs.
5. Required for: What department (or reason).
6. Requisitioned by: Who is ordering the part.
7. Date of requisition: Today's date
8. Date required: When you need it.

141

QUALITY PROFESSIONAL CUTLERY

COOKS' KNIVES: Chrome Tool Steel, flexible, forged blade & bolster, Rosewood Handle. Finest made.
#60766-8, 8" blade	$ 5.25 ea.
#60766-10, 10" blade	$ 6.55 ea.
#60766-12, 12" blade	$ 8.00 ea.
#60766-14, 14" blade	$ 9.65 ea.

COOKS' KNIVES: Carbon Steel, stiff blade, Ebanwood handle.
#61166-8, 8" blade	$ 2.65 ea.
#61166-10, 10" blade	$ 3.10 ea.
#61166-12, 12" blade	$ 3.75 ea.
#61166-14, 14" blade	$ 4.70 ea.

MEAT SLICERS: Flexible Blade, Rosewood Handle.
	No. 6S45 Stainless Steel
No. 6S45 – 8" blade	$ 2.65 ea.
No. 6S45 – 10" blade	$ 3.75 ea.
No. 6S45 – 12" blade	$ 4.10 ea.

HAM SLICERS: Stainless Steel Flexible Blade, Rosewood Handle.
#6S03-10, 10" blade	$ 3.65 ea.
#6S03-12, 12" blade	$ 4.10 ea.

LUNCHEON SLICER: Stainless Steel, Rosewood Handle.
#6S46, 8" blade	$ 2.55 ea.

BREAD KNIVES: Serrated Stainless Steel. Rosewood Handle.
#6S49, 9" blade	$ 3.10 ea.

#BBK8, 8" blade	$ 1.55 ea.
#BBK9, 9" blade	$ 1.85 ea.

UTILITY KNIFE: Serrated Blade, Wonderful for slicing tomatoes, rolls etc.
#RUK-5 5" Wave-Cut Blade	$ .90 ea.

GRAPEFRUIT KNIVES: 3½" blade. Stainless Steel, Double Serrated.
#EGK-3, Household Type	$ .45 ea.
#BGK-3, Restaurant Type	$ .80 ea.
#6S-12, Hotel Type	$ 1.70 ea.

UTILITY KNIVES: Stainless Steel, Rosewood Handle.
#6S15, 6" Blade	$ 1.70 ea.

PARING KNIVES: Stainless Steel, Rosewood Handle.
#JPK-3, 3" blade, economy	$ .25 ea.
#BPK-3S, 3" serrated blade	$ .50 ea.
#RPK-3, 3¼" blade, standard	$ .50 ea.
#RPK-3B, 3¼" with bolster	$ .55 ea.
#6S-19, 3¼" professional	$ .95 ea.

PARING KNIVES: Stainless Steel, Rosewood Handle
#6S-20, 3¼" blade	$ .95 ea.
#6S-16, 3¼" blade	$ 1.35 ea.

BUTCHER KNIVES: Chrome Tool Steel Blade
#6280-8, 8" blade	$ 3.00 ea.
#6280-10, 10" blade	$ 3.65 ea.
#6280-12, 12" blade	$ 4.40 ea.

BUTCHER STEELS: (Knife Sharpeners) Carbon Steel, forged, magnetized.
#157, Knurled blade, Maple Handle
#6570, Straight cut blade, Rosewood Handle.

No. 157 Maple Handle	Blade Size	No. 6570 Rosewood Handle
$ 2.80 ea.	10"	----------
$ 3.05 ea.	12"	$ 5.15 ea.
$ 3.60 ea.	14"	$ 5.45 ea.
$ 4.30 ea.	16"	----------

BONING KNIVES: 6" wide blade.
#RBK-06, Carbon Steel	$ .95 ea.
#6280-6, Chrome Tool Steel	$ 2.05 ea.

BONING KNIVES: 6" Narrow blade.
#6280N-6, Chrome Tool Steel	$ 2.05 ea.

COOKS' FORKS: Heavy duty, Forged Carbon Steel, Extra-heavy construction. 14" Size also available in Stainless Steel.
Rosewood Handle	OveraH	Maple Handle
#67B $ 4.20 ea.	12"	#87B $ 3.55 ea.
#69B $ 5.00 ea.	14"	#89B $ 4.05 ea.
#611B $ 8.20 ea.	17"	
#6S9B $ 8.25 ea.	14"	Stainless Steel.

FORKS: Utility, Kitchen, Pot.
NO.	Overall	Tines	PRICE
#RUF-10	10"	Stainless	$ .95 ea.
#RUF-13	13"	Stainless	$ 1.35 ea.
#770-L	20½"	Carbon Steel	$ 3.10 ea.

HEAVY DUTY CLEAVERS
No.L-85, 7" blade $ 3.80 ea.
No.L828, 8" blade $ 6.10 ea.
Chicken CLEAVER, light duty
No.RCC-7 6" blade $ 1.70 ea.

SANDWICH SPREADER: Stainless Steel Blade, 3½" x 1¼"
#6S-08, Commercial	$ 1.45 ea.
#WSS-4, Economy	$ .55 ea.

ICING KNIFE: 6½" x 1½" Stainless Steel Blade, Rosewood Handle. Best Quality.
#6S-04	$ 2.40 ea.

PIE SERVER: 6" x 2½" Offset Stainless Steel Blade. Rosewood Handle. Best Quality.
KT-27	$ 1.40 ea.
6S09B, Deluxe Model	$ 2.55 ea.
#SPS-10, all stainless	$ .85 ea.

PAN SCRAPER: 3"x4" SS blade Please Specify:
S-117S, Stiff blade
S-117F, Flexible blade .... $ 1.65 ea.

BAKERS' SCRAPERS Carbon Steel 6" x 3" Blade
#12 Semi-Flexible .... $ 1.20 ea.
#6E Flexible .... $ 1.60 ea.

NEW...ALL STAINLESS STEEL
#BAK-4 4-1/8" x 3¼" Stiff Blade....... $1.25 ea.
#BAK-6 6" x 3¼" Stiff Blade............ $1.50 ea.

BOWL SCRAPERS: Heavy Rubber Blade, Maple Handle.
#8R, 8" x 2¼" blade .... $ 2.55 (24

SPATULAS: Flexible Stainless Steel Blade.
NO.	BLADE SIZE	PRICE
#BK-03	3" x 11/16"	$ .80 ea.
#BK-04	4" x 3/4"	$1.05 ea.
#BK-05	5" x 13/16"	$1.15 ea.
#6S01-6	6" x 1"	$1.55 ea.
#6S01-8	8" x 1-1/4"	$2.35 ea.
#6S01-10	10" x 1-1/2"	$3.15 ea.
#6S01-12	12" x 1-3/4"	$4.65 ea.
#6S01-14	14" x 2"	$6.20 ea.

TURNERS: Stainless Steel Offset Blade. Rosewood Handle. Sizes shown are for flat surface of blade.
#25S, Stiff blade, heavy duty
#491, Small, semi flexible
#25S, 4" x 3" blade	$ 1.50 ea.
#491, 3" x 2" blade	$ 1.05 ea.

TURNERS: Long Blade. 8" x 3" blade, offset, 14" overall.
#VB-50, Stainless Steel	$ 2.25 ea.

CAKE TURNER: 6" x 2½" Stainless Steel Offset Blade. Rosewood Handle.
#6S-07B	$ 2.60 ea.

PARING KNIVES #R-335
3-1/8" Stainless Steel Blade. Deluxe Bolster Construction. Rosewood Handle. $.80
Less than doz $.45 ea.

IMPORT CLOSEOUT, $5.00 Value Forged Stainless Steel Forks Wood Grain Plastic Handles 10-1/2" long, for Serving, Carving and general kitchen use.
No. CKF-11 .... $ 1.25 EA.
6 or more........ $ 1.00 ea.

⑪

142

ASSIGNMENT A:

Use Page 11 from the Admiral Craft Equipment catalog and the blank form below to order the following items:

      1 10" Cook's knife, chrome steel
      1 17" Cook's fork, heavy duty
      5 3¼" professional paring knives
      1 4"X 3" blade turner

Note: Use the Admiral Craft catalog numbers and make certain your description is written clearly and completely. Use prices from catalog and total the requisition.

Requisition for ordering supplies outside of restaurant.

PURCHASE REQUISITION							
TO: PURCHASING DEPARTMENT. Please order the following:							
Vendor:						No.	
Date Ordered	Terms		F.O.B.	Ship via	Date Promised	Quotation Number	
QUANTITY	PART NO.	DESCRIPTION AND MANUFACTURER				UNIT PRICE	TOTAL PRICE
			Date of requisition		Date required		
Required for:		Requisitioned by:		Approved by:			

143

MISCELLANEOUS PLASTIC ITEMS

new

LARGE 20 OUNCE UNBREAKABLE POLYETHYLENE SUGAR & NO-DRIP SYRUP SERVERS

● BIG 20 Ounce Capacity ● Unbreakable Frost-White Container ● Colorful Tops
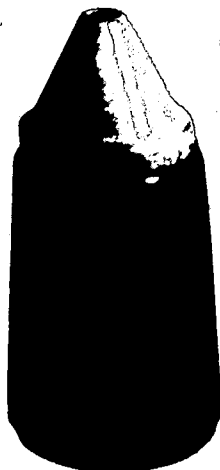
No. D-115 – SUGAR, 20 OZ.

SAVES SUGAR – Pours only 1 Teaspoon at a time (special feature in top may be removed for regular free-flow pouring) 3" Diam., 6½" High. Frost-White Lowers, Colorful Tops.

#D-115

$4.80

In carton lots of 2 dozen ASSORTED (6 each tops in Tan, Pink, Yellow and Turquoise).

In SOLID COLOR packing (ctn. lots of 2 doz.)
Your Choice: Tan – Yellow
Pink – Turquoise or Tangerine
(with Frost-White lower containers) ....

$5.40

In 1 dozen lots .... $6.00 doz.
Less than 1 dozen .... $ .55 ea.

No. D-116
NO-DRIP SERVER

For: SYRUP – MILK – CREAM – Etc.
3" Diam., 6" High. Frost-White Lowers - Colorful Tops.

$6.00 doz.

In carton lots of 2 dozen ASSORTED (6 each tops in Tan – Pink Yellow & Turquoise)

In SOLID COLOR packing (ctn. lots of 2 dozen).
Your Choice: Tan
Yellow – Pink or
Turquoise (all with
Frost-White lower
containers) ....

$6.60

D-116

In 1 dozen lots .... $ 7.20 doz.
Less than 1 dozen .... $ .75 ea.

HEAVY-DUTY DISH BOXES

$1.75 EA.

In lots of 12 or more
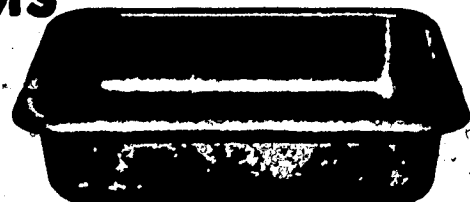
POLYETHYLENE, in Tan or Dark Gray:
No. CDB-15205, 15" x 20" x-5", Reg. $3.00.. $2.25 ea.
In full carton lots of 12 or more .... $1.75 ea.

No. BGB-1121
Reg. $3.95 Value

$1.75 EA.

6 or more

Less than 6 ...$2.00 ea.

Avocado, Gold or Gray

CUTLERY BOX, 4-Compartment
Heavy Duty Polyethylene,
Big 21½" x 11½" x 3¾" deep

HEAVY-DUTY POLYETHYLENE DISH BOXES

The most modern and durable plastic boxes you can buy: Safe in Dishwashers, Boilable, Unbreakable and Sanitary. They nest for easy storage. Fits all standard dish carts.

Colors: White, Tan, Gray or Red, 12 to a carton

$1.40

72 or more
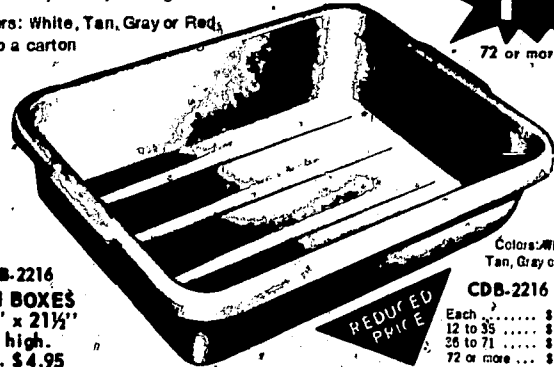
CDB-2216
DISH BOXES
15½" x 21½"
5" high.
Reg. $4.95

Colors: White, Tan, Gray or Red

CDB-2216

Each $2.00
12 to 35 ..... $1.75
36 to 71 ..... $1.50
72 or more ... $1.40

REDUCED PRICE

MARLEX POLYETHYLENE "SILVER-SAVER" TOTE BOX

Holds 3 Silver Cylinders
No More Assorting Silver
Extra-Deep, Holds More
Size: 27" x 16" x 7½" deep

Model 260A Tote Box
27" x 16" x 7½"
Without Cylinders ....

$5

Model 260AW3C With Cylinders $8.80 ea.
Extra Silver Cylinders .... $ .95 ea.

ADMIRAL

*NOISELESS *LIGHTWEIGHT
*UNBREAKABLE
*WON'T RUST or DENT
For:... Gasoline, Naptha, Kerosene, Solvents, Inks, Acids, Water, Food Stuffs, Drugs, Chemicals, etc.

ADMIRAL CRAFT EQUIPMENT CORP

HEAVY-DUTY JERRY JUGS

Equipped with cap, pouring spout, cap for spout, measuring cup.

No. JJ-1, 1 Gallon

$1.50 EA.

Order NOW

NO.	RATED	HOLDS	EACH	12/MORE
JJ-1	1 Gallon	5 Quarts	$1.60	$1.50 ea.
JJ-3	2½ Gallon	11 Quarts	$2.50	$2.25 ea.
JJ-5	5 Gallon	22 Quarts	$4.00	$3.75 ea.

May be assorted for quantity price schedule

58

SQUEEZE-OUTS

Plastic Dispensers for: Ketchup, Mustard, and other table liquids, have an 8-ounce capacity. The Squeeze-Out dispenser features a Nev-R-Drip nozzle which regulates the flow as the user desires and also controls the contents of each dispenser so that it will not drip even when knocked over.

#PBD-1, "Mustard", Yellow
#PBD-2, "Ketchup", Red
*PBD-3, No marking, natural

$1.95 DOZ.

KETCHUP   MUSTARD

	Dozen	Less than dozen
Standard 8 oz.	$ 1.95	$.25 ea.
Large 12 oz.	$ 3.60	$ .40 ea.

144
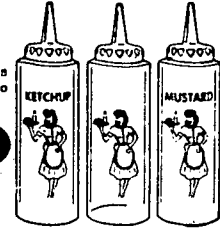
ASSIGNMENT B:

Complete the following requisition, using page 58 in the Admiral Craft Equipment catalog.

1 dozen sugar servers, turquoise-color top only
6 no-drip servers, turquoise top only
6 15" X 20" X 5" dish boxes, tan
3 dozen squeeze-outs, mustard, standard
3 dozen squeeze-outs, ketchup, standard

Total your order and put total on the requisition.

Requisition for ordering supplies outside of restaurant.

PURCHASE REQUISITION							
TO: PURCHASING DEPARTMENT. Please order the following:							
Vendor:							No.
Date Ordered	Terms		F.O.B.	Ship via		Date Promised	Quotation Number
QUANTITY	PART NO.	DESCRIPTION AND MANUFACTURER				UNIT PRICE	TOTAL PRICE
			Date of requisition			Date required	
Required for:		Requisitioned by:		Approved by			

145

UNIT V – PERCENTAGE

Lesson 1

Getting Reacquainted

Objective: You will understand the meaning of percentage and know some of its uses.

Related Information:

Percent plays an extremely important role in our daily lives.

90 %
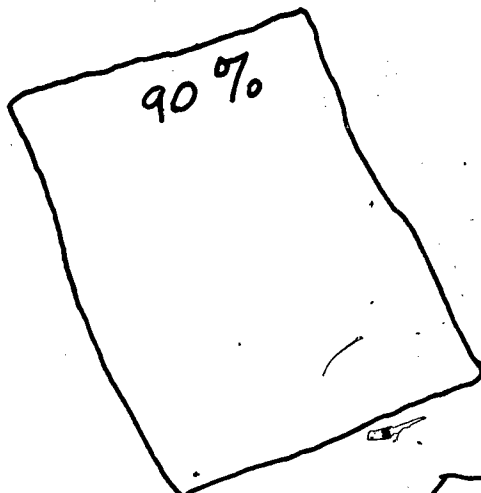
Tests are scored by percent.

Bank accounts pay interest by percent.

6%

A YEAR FROM DAY OF DEPOSIT

2-Year Savings Certificates: Minimum only $500
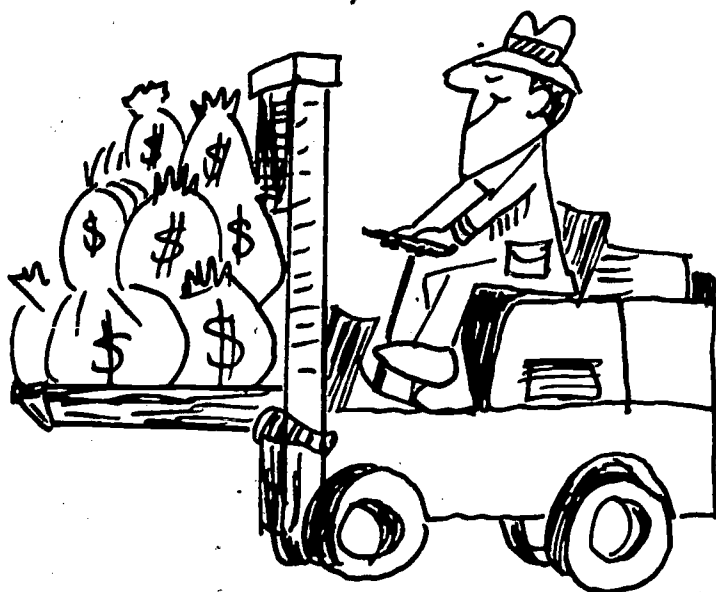
We make loans and pay interest by percent

155   146

A waiter or waitress gets
tips by percent.

25¢

10¢

25¢

5¢
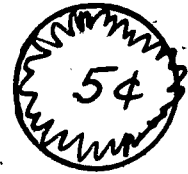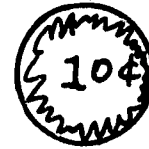
5%

We pay sales tax by percent.

40%
OFF LIST

Sales in stores are often
quoted in percent.
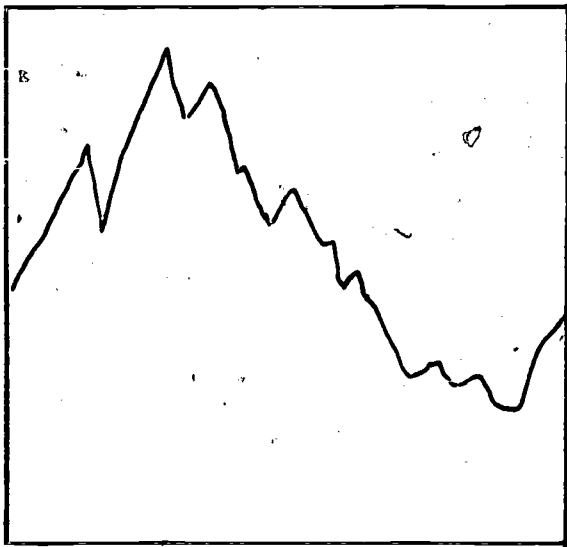
Businesses state their profit
or loss in percent.

147

It should be clear by now that percent plays an important role in our lives. Every student and worker should understand what percent means and how to do some basic percentage problems. You will be working with percents of one sort or another for your whole life.

BUT

Before we go forward......we have to go back and make sure we know how to change from fractions to decimals and to percents, and vice-versa. Without this skill we will constantly make errors while doing percentage problems.

Some things can be said in many different ways. For example, if we write the number "1" or the word "one" or the Roman numeral "I" we all understand that they mean the same thing. This is also true with fractions, decimals, and percents. They are different ways of saying the same thing.

1/2 of a pie . . . . is the same as 50% of a pie . . . . is the same as .50 (fifty-hundredths) of a pie.

Each occupation or business has its own customs and has adopted the expressions which they feel most comfortable with.

We generally say: a 15% to 20% tip   rather than a 15/100 tip or 1/5th tip

We generally say: 1/2 pound   rather than 50% of a pound

ASSIGNMENT:

Circle the expression that you think is most commonly used:

(a)	1/4 lb.	.25 lb.	25% of a pound
(b)	$\frac{15}{100}$ off list	.15 off	15% off
(c)	1/2 dollar	$.50	50% of a dollar
(d)	8/100 interest	.08 interest	8% interest
(e)	2/10 mile	.2 mile	20% of a mile
(f)	1/50 off list	.02 off	2% off
(g)	23/100 increase	.23 increase	23% increase
(h)	1/4 dollar	$.25	25% of a dollar

157

Objective: You will be able to change percents to decimal fractions.

Related Information:

Percents are great. We see them all the time, and we even use them a lot ourselves. When the ad says: "20% off regular price," we have a pretty good idea of how much this means.

There's one big trouble with percents, however — *we cannot use them in working out problems in arithmetic.* In order to use a percent in a problem we must first convert it to an ordinary fraction or a decimal fraction that means the same thing.

TO CHANGE A PERCENT TO A DECIMAL.

MEMORIZE THIS RULE:*To change a percent to a decimal, drop the % sign and move the decimal point TWO places to the left.*

Remember — whether you see it or not, *every number has a decimal point.*

<p style="text-align:center">35%   35.%   35.   35.   .35</p>

Look at the sketch above. It contains a good clue to remembering which direction to move the decimal point. Notice that the percent sign looks something like an arrow. It is indicating which direction to move.

BUT — You have to remember to move TWO places . . . always *two* places, regardless of whether the number has one, two, or three digits. You may have to insert a zero to get the two places.

Sample problems:

$$35\% = 35.\% = .35$$

$$5\% = 5.\% = .05$$

$$155\% = 155.\% = 1.55$$

$$25\tfrac{1}{2}\% = 25.5\% = .255$$

In order to do the last problem above, you have to know that 1/2 equals .5. We will talk about the decimal equivalents of most common fractions later.

ASSIGNMENT A:

Do the following problems. Your instructor will go over them in a few minutes. If you get them all correct, you will soon be ready for the main assignment.

1. 30% Change to a decimal: _____   6. 6.1% _____

2. 60% Change to a decimal: _____   7. 7.85% _____

3. 8% Change to a decimal: _____   8. 8.2% _____

4. 125% Change to a decimal: _____   9. 9.2½% _____

5. 18½ Change to a decimal: _____   10. 6½% _____

11. When changing from a percent to a decimal you (sometimes) (always) (never) move the decimal point two places to the left. (Circle the correct answer.)

12. When converting a percent containing a fraction, such as 5½%

First _____

Then _____

In the problems above, we sometimes found it necessary to change ½ to .5, its decimal equivalent. But suppose we had a more difficult problem — suppose we had to change $4\frac{7}{8}\%$ to its decimal equivalent. How would we do it?

First we would have to convert the $\frac{7}{8}$ to a decimal. To do that, carry out the division that is indicated by the form of the fraction:

$$\frac{7}{8} = 8\overline{)7}$$

We see that 8 will not go into 7. So we add a decimal point after the 7 and some zeros, and we carry out the division.

```
      .875
8) 7.000
   6 4
   ----
     60
     56
     ----
     40
     40
     ----
```

Now we know that $4\frac{7}{8}\% = 4.875\%$, and we can proceed to find its decimal equivalent.

$$4\frac{7}{8}\% = 4.875\% = 4.875\% = .04875$$

It would be pretty sad if, every time you saw a fraction and needed to know what percent it equaled, you had to go through the actual division. Since there are only a few common fractions that you will use often, it is not too difficult to memorize their decimal equivalents. Particularly if you use a calculator, you need to know the decimal form of a fraction, for calculators use decimals, not fractions.

Here is the table of equivalents you need to memorize.

1/2 = .5	1/8 = .125	1/3 = .333	1/5 = .2	1/10 = .1
1/4 = .25	3/8 = .375	2/3 = .667	2/5 = .4	2/10 = .2
3/4 = .75	5/8 = .625		3/5 = .6	3/10 = .3
	7/8 = .875		4/5 = .8	etc.

Now it is a simple matter to change a fractional percent to a decimal.

Example: Change 5 3/8% to a decimal.

5 3/8% (1) Change fractional part to a decimal: 3/8 to .375.

5.375% (2) Substitute the .375 for the 3/8. Note: The .375 has the decimal. The % sign remains.

.05375 (3) Now move the decimal point two places and drop the percent sign.

There may be other occasions when you are working with fractions (as in addition, subtraction, multiplication, or division), when it would be easier to use their decimal equivalents. Always use the way that is easiest for you. If you forget a decimal equivalent, or have an unusual fraction for some reason, all you have to do is divide out the fraction, as we did above with 7/8. This can even be done with a calculator if you have one handy.

ASSIGNMENT B:

Change the following percents to decimals.

1. 48% _____   16. 4.3% _____

2. 76% _____   17. 5.7% _____

3. 19% _____   18. 100% _____

4. 15% _____   19. 8.2% _____

5. 300% _____   20. 3½% _____

6. 250% _____   21. .16% _____

7. 6% _____   22. 825% _____

8. 2% _____   23. .15% _____

9. 1% _____   24. .02% _____

10. 10% _____   25. 2000% _____

11. 45% _____   26. .032% _____

12. 42.7% _____   27. .04% _____

13. 39.4% _____   28. 3.9% _____

14. 156.8% _____   29. ½% _____

15. 32.6% _____   30. ¾% _____

151

31. 6¼%   _____   36. 8.2%   _____

32. 16½%   _____   37. $4\frac{1}{8}$%   _____

33. 17¼%   _____   38. 12½%   _____

34. 26 ¾%   _____   39. $33\frac{1}{3}$ % _____

35. 6 2/5%   _____   40. .32%   _____

152
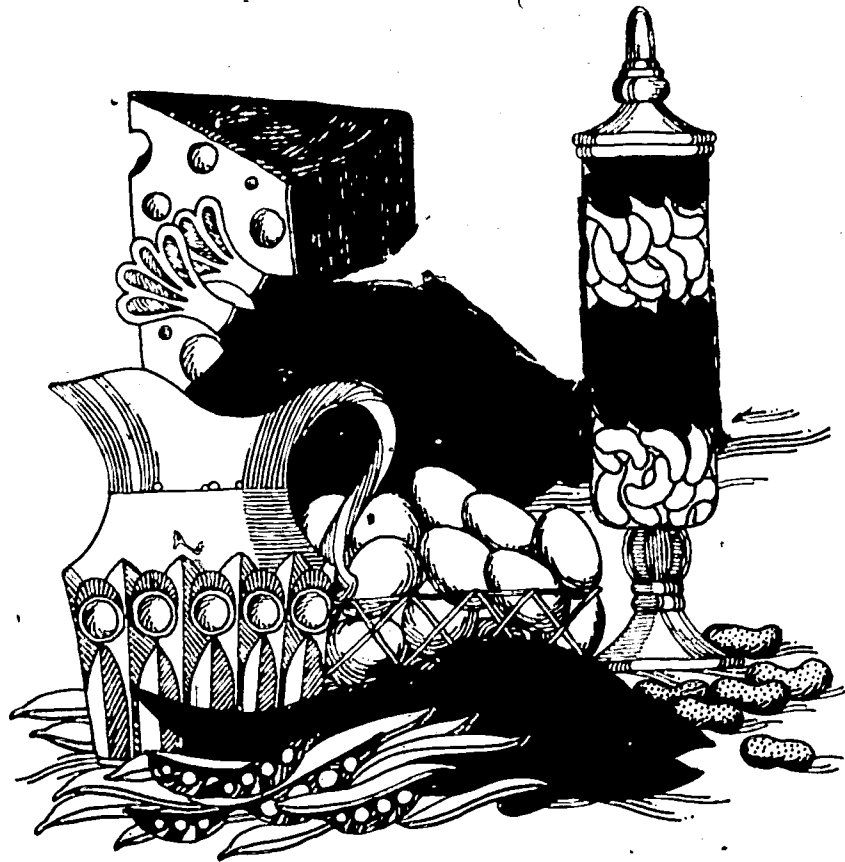
Lesson 3   Decimals to Percents

Objective: You will be able to change a decimal to a percent.

Related Information:

If you learned your rule well for changing a percent to a decimal, you will have little difficulty learning how to change a decimal to a percent. It's just the opposite.

TO CHANGE A DECIMAL TO A PERCENT: Move the decimal point *two* places to the right and *add* a percent sign.

Examples: .50 = 50%   (.50   .50   50.%   50%)

             .5 = 50%/   (.5   .5   50.%   50%)

             5.5 = 550%   (5.5   5.5   550.%   550%)

             50 = 5000% (50   50.   5000.%   5000%)

Note above that in each case we moved the decimal point two places to the right. Add zeros if necessary. . . . but make sure you move two places.

Where there is a whole number to be changed to a percent, as in 50 above, the decimal is understood to be after the 50 — although we did not have to show it in the whole number. But when you must change the 50 to a percent, you need to show that decimal. You put it in and move it two places to the right.

In all the examples above, the percent that we obtained was a whole number. Therefore we were able to drop the decimal point after the number. But if you obtain a decimal fraction for an answer, you would naturally keep the decimal point.

Examples: .125 = 12.5% (You might prefer to call this 12½%.)

             6.3333 = 63.33% (You might prefer to call this 63 1/3%.)

ASSIGNMENT A:

Do the following problems. Your instructor will go over them in a few minutes. If you get them correct, you are about ready for the main assignment.

1. .10 Change to a percent: _____   6. 20   _____

2. .80 Change to a percent: _____   7. 2.05 _____

3. .2   Change to a percent: _____   8. .725 _____

4. 4.5 Change to a percent: _____   9. .3   _____

5. .45 Change to a percent: _____   10. .3075 _____

153

So far we have avoided problems involving fractions. Following is an example of how to change a mixed number to a percent:

8½	Step 1.	Change the fraction to a decimal (½ = .5)
8.5		This is the equivalent decimal.
8.50	Step 2.	Move decimal point two places to the right.
850%	Step 3.	Add the percent sign.

ASSIGNMENT B:

1. $2\frac{1}{4}$ Change to a percent: _____
2. $10\frac{1}{2}$ Change to a percent: _____
3. $1\frac{3}{4}$ Change to a percent: _____
4. $6\frac{2}{3}$ Change to a percent: _____
5. $1\frac{3}{8}$ Change to a percent: _____

ASSIGNMENT C:

Change the following decimals to percents:

1. .43	_____	11. .005	_____
2. 3	_____	12. .045	_____
3. .17	_____	13. .0275	_____
4. 1.34	_____	14. $2\frac{1}{3}$	_____
5. 2.08	_____	15. $1\frac{1}{2}$	_____
6. .07	_____	16. $2\frac{3}{5}$	_____
7. .02	_____	17. $3\frac{1}{4}$	_____
8. .325	_____	18. $5\frac{3}{4}$	_____
9. .304	_____	19. 1	_____
10. 2.5	_____	20. .01	_____

163

UNIT V – PERCENTAGE

Objective: You will be able to change a percent to a fraction.

Related Information:

What does "Percent" actually mean?

The "cent" part comes from the Latin word "centum." meaning hundred. "Percent" means *for each hundred.*

If we say 5% we mean *5 out of each 100.*

If we say 30% we mean *30 out of each 100.*

Percent is simply another way of expressing a fraction. (Remember we said that, even when the language is different, the meaning may be the same.)

3% means 3 out of a hundred or $\frac{3}{100}$

10% means 10 out of a hundred or $\frac{10}{100}$

We can reduce this latter fraction to lowest terms, and we get 1/10, or one out of 10.

ASSIGNMENT:

A.   Change the following percents to fractions with 100 as the denominator.

1.   30% expressed as a fraction equals   _____

2.   8% expressed as a fraction equals   _____

3.   75% expressed as a fraction equals   _____

4.   124% expressed as a fraction equals   _____

5.   1% expressed as a fraction equals   _____

B.   Now practice reducing the fractions to lowest terms.

1.   20/100 reduced to lowest terms is: _____

2.   5/100 reduced to lowest terms is   _____

3.   200/100 reduced to lowest terms is   _____

4.   25/100 reduced to lowest terms is   _____

5.   75/100 reduced to lowest terms is   _____

164

C. Change the following percents to fractions or mixed numbers in lowest terms:

Note: If you cannot reduce the fraction, that means it is already *in* its lowest terms.

Example: 23% = 23/100 (That is the answer.)

1. 40%   _____   8. 15%   _____
2. 60%   _____   9. 47%   _____
3. 45%   _____   10. 125%   _____
4. 80%   _____   11. 7%   _____
5. 100%   _____   12. 88%   _____
6. 5%   _____   13. 200%   _____
7. 73%   _____   14. 325%   _____

You will sometimes have to convert fractional percents to ordinary fractions. This can be done by actually dividing by 100. For example, to express 37½% as a fraction, here is what you would do:

$$37\frac{1}{2}\% = \frac{75}{2}\% = \frac{75}{2} \div 100$$

$$\frac{75}{2} \div \frac{100}{1} = \frac{75}{2} \times \frac{1}{100} = \frac{75}{200}$$

The number 25 divides evenly into both parts of the fraction:

$$\frac{75}{200} = \frac{3}{8}$$

You may already have recognized the 37½% as .375 or 3/8.

In Assignment D, if you recognize any of the fractional percents, just write in the correct answer without going through the division process.

ASSIGNMENT D:

1. 12 1/2%   _____

2. 33 1/3%   _____

3. 8 1/3%   _____

4. 16 2/3%   _____

5. 62 1/2%   _____

165

6. 66 2/3%   _____

7. 2 1/2%   _____

8. 6 1/4%   _____

9. 87 1/2%   _____

10. 83 1/3%   _____

Another difficulty students have with percent:

     ½% is *not* 50%:   ½% is very *small*; 50% is *large*

     ¼% is *not* 25%:   ¼% is very small; 25% is fairly large

ASSIGNMENT E: Convert the following percents to fractions in lowest terms.

1. 25%   _____

2. 250%   _____

3. 75%   _____

4. ½%   _____

5. ¼%   _____

6. ¾%   _____

7. 7.5%   _____

8. 12½%   _____

9. 1/8%   _____

10. 2%   _____

     You will not have much use for small fractional percents, except in figuring interest, and then they are usually part of a mixed number. For example, a bank might pay interest at 5¾% or 6¼%, etc. The fractional percent adds just a bit extra.

166

Lesson 5   Reading Decimals

Objective: You will be able to read decimal fractions accurately.

Related Information:

Sometimes you will find it necessary to change a decimal fraction to an ordinary, proper fraction. Changing a decimal fraction to an ordinary fraction is a very simple procedure *if you know how to read a decimal properly*. For this reason a simple review is in order.

2 or 2.	is read as "two"
.2	is read as "two tenths"
.22	is read as "twenty-two hundredths"
.222	is read as "two hundred twenty-two thousandths"

MEMORIZE:
.□	one place = tenths
.□□	two places = hundredths
.□□□	three places = thousandths
.□□□□	four places = ten-thousandths

Some more examples before the assignment:

2.2	= two *and* two tenths (Note: the decimal point is read as "and.")
2.02	= two and two hundredths (the zero is silent)
2.002	= two and two thousandths
22.0022	= twenty-two and twenty-two ten-thousandths

Read the number before the decimal; then say the *and*; then read the number after the decimal and indicate the number of places by saying *tenths, hundredths, thousandths,* or *ten-thousandths.*

Note: Thousandths and ten-thousandths are very important in certain trades, where great accuracy in measurements is needed – for example, in the machinist trade. As a foods trade worker, you will rarely see them, but still, you should know what they mean.

ASSIGNMENT

A.   Write in words and read orally the following:

1.   .8   _____

2.   .1   _____

3.   1.5   _____

4.   .03   _____

5.   .24   _____

158

B. Write the following in words:

1. .86 _____

2. 1.6 _____

3. 2.9 _____

4. 38.5 _____

5. 14.3 _____

6. 126.4 _____

7. 7.37 _____

8. 89.03 _____

9. 30.46 _____

10. 248.19 _____

11. .005 _____

12. .008 _____

13. .025 _____

14. .832 _____

15. 6.005 _____

16. 1.758 _____

17. 86.528 _____

18. 200.042 _____

19. .606 _____

20. .045 _____

159

168

Objective: You will be able to convert a decimal fraction to an ordinary fraction.

Related Information:

Now that we have reviewed how to read decimal fractions, you should have no trouble learning to convert decimal fractions to ordinary fractions.

Step 1.   READ THE NUMBER. Example: .5 = 5 tenths

Step 2.   Put the number (5) over the word: $\frac{5}{tenths}$ (change to ten) $\frac{5}{10}$

Step 3.   Reduce to lowest terms: $\frac{5}{10}$ becomes $\frac{1}{2}$.

Example 2:   .25 becomes "twenty-five hundredths," or $\frac{25}{100}$.

Remember:

When you say "tenths," put a 10 under the line of the fraction.

When you say "hundredths," put 100 under the line of the fraction.

When you say "thousandths," put 1000 under the line of the fraction.

Example 3:   .125 becomes "one hundred and twenty-five thousandths," or $\frac{125}{1000}$.

You can often reduce the fraction. This one becomes $\frac{1}{8}$. Perhaps you recognize an old friend, .125 = 1/8.

ASSIGNMENT A:

1.   .8   Change to a fraction:

2.   .30   Change to a fraction:

3.   .02   Change to a fraction:

4.   .800 Change to a fraction:

5.   .17   Change to a fraction:

Sometimes a problem involves a whole number and a decimal:

Example: 2.5 is read as "two and five tenths," which becomes $2\frac{5}{10}$.

Reducing, it becomes $2\frac{1}{2}$.

169

ASSIGNMENT B:

1.   31.5 Change to a whole number and fraction: _____

2.   2.4 Change to a whole number and fraction: _____

3.   50.5 Change to a whole number and fraction: _____

ASSIGNMENT C:

Change the following to fractions or mixed numbers in lowest terms.

1. .20 _____

2. .75 _____

3. .05 _____

4. .10 _____

5. .625 _____

6. 2.40 _____

7. .375 _____

8. 50.75 _____

9. 1.5 _____

10. 4.25 _____

11. 20.80 _____

12. .875 _____

Lesson 7 _____ Fractions to Decimals to Percents

Objectives: You will be able to change a fraction to a decimal. Based upon work in previous units, you should then be able to convert the decimal to a percent.

Related Information:

Back on page 150, we showed you how to convert an ordinary fraction to a decimal fraction. So as to avoid having to do this, we suggested that you memorize the decimal equivalents of the most frequently used fractions.

Sometimes, however, you may forget these equivalents. Then you have to work them out again. So let us review how this is done.

To change a fraction to a decimal, *divide the denominator into the numerator.*

Example: $\frac{1}{2}$ becomes $2\overline{)\ 1\ }$

- The 2 won't go into the 1. So we add a decimal point and one or two zeros. (If we are aiming for a percent, it is helpful to use two zeros, or more if necessary.)

$2\overline{)1.00}$ Then divide: $2\overline{)1.00}^{\ \ .50}$

The answer, .50, can now be changed simply to 50%.

(Recall the rule: To change a decimal fraction to a percent, move the decimal point two places to the *right and add the % sign.*)

ASSIGNMENT A:

1. 1/4 Change to a decimal and percent: _____   _____

2. 1/8 Change to a decimal and percent: .   _____   _____

3. 1/5 Change to a decimal and percent: _____   _____

ASSIGNMENT B:
Change the following to decimals and percents:

1. 1/10   _____   _____

2. 3/8·   _____   _____

3. 3/5   _____   _____

4. 1/3   _____   _____

171

5. 1/5   _____   _____

6. 1/100   _____   _____

7. 3/10   _____   _____

8. 4/5   _____   _____

9. 1/6   _____   _____

10. 2/3   _____   _____

11. 1/16   _____   _____

12. 1/12   _____   _____

What do you suppose could delight 100% of these bakers so much?

163

ASSIGNMENT C:

By now you should be able to convert from any one form to any other. . . so let's try this chart. Refer back to previous pages if you have trouble. Do not try to do the ratio column at this point.)

No.	Fraction	Decimal	Percent	Ratio
1.		.50		
2.	$\frac{1}{4}$			
3.			75%	
4.		.125		
5.	$\frac{3}{8}$			
6.		.333		
7.	$\frac{1}{10}$			
8.			$66\frac{2}{3}\%$	
9.		.20		
10.			15%	
11.			80%	
12.		.875		
13.	$\frac{1}{25}$			
14.			$62\frac{1}{2}\%$	
15.			$\frac{1}{2}\%$	

-164

Objectives: You will review the meaning of percent.
You will learn to solve two different types of percentage problems.

Related Information:

Up to this point you have been learning the mechanics of changing from decimal fraction to percent, percent to decimal fraction, and decimal fraction to ordinary fraction. At this point it is important that you make certain you understand the meaning of percent.

In a previous unit we mentioned that percent means *for each hundred.*

50% means 50 out of each 100   or $\frac{50}{100}$,   which equals $\frac{1}{2}$.

You should memorize certain percentages.

100% equals the *whole thing.*

Two whole things equals 200%.

When we think of percent we must know *what is meant by* the whole thing. Someone must tell us what it is.

A 12″ apple pie might be the *whole thing* or the *original amount*, or 100%.

An 8″ apple pie might be the *whole thing* or the *original amount*, or 100%.

100% of the 12″ pie is certainly not the same thing as 100% of the 8″ pie.

If the 12″ pie represents the whole thing, then two 12″ pies would be 200%, three 12″ pies 300%.

If we cut the 12″ pie in half, we now have 1/2 or 50% (of the 12″ pie).

Original pie:
100%

Half of the
original pie:
50%
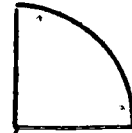
One-quarter of the
original pie:
25%

165
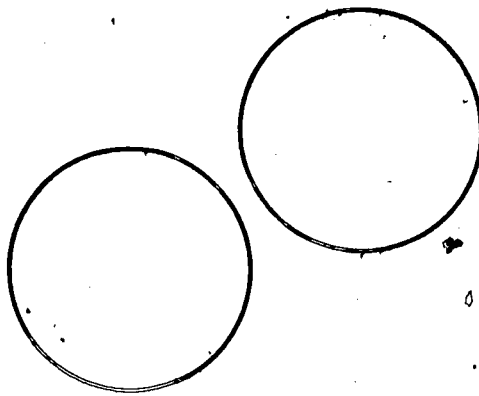
Original pie plus
another like it:
200%

Learn to picture the whole thing or the original amount in your mind. A 20% tip is 20% of the whole cost of the dinner; 5% interest on your bank account means 5% of all the money you have in the bank (the whole thing). It also means 5 dollars for each 100 dollars. Keep these two related concepts in mind.

100% means the whole thing;

· 50% is half of the whole thing;

25% is one quarter of the whole thing.

1% is a very small amount (1 out of each 100) of the whole thing, and ½% is an even smaller amount (½ of 1%).

Original
amount
= 100%
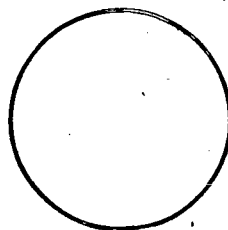
Original
amount
= 100%

Here we have two things, each being 100% — but they are not equal. In thinking about percent, you must always have in mind what the original amount is.

When working with percentages, we generally must be very exact. A difference in ½% in a mortgage loan on a business may amount to thousands of dollars over a long period of time. When a discount is made on an item, it must be correct to the nearest cent.

166

DIFFERENT USES OF PERCENT

In the food-service industry, *tips* are based on a percent of the price of the meal: either 15% or 20% is standard today for a waiter or waitress.

When a restaurant bill is added up, often a tax must be added to it. This tax presently amounts to 5% in the State of New Jersey.

If you pay your bills promptly, you may be allowed a 2% *discount*. On the other hand, you may have to pay extra if you do not pay your bill on time.

Whether taking out a *loan* for the business, paying a *mortgage*, or dealing with your own personal savings account, *interest* is expressed as a percent. We hear about inflation and how the cost of living goes up; this too is expressed as a percent. Businessmen, in discussing their business, use terms such as "we did 20% better than last month."

Percentage problems seem difficult to do because there are three different types of problems. Since one of the types is not often met with in everyday living, we shall skip it, and learn to do the two types that you will come upon often in your work and in your nonworking life. We will call them Type A and Type B problems.

TYPE-A PERCENTAGE PROBLEM

You total up a guest check. . . this total is called the original amount. Example: Price of a dinner — $5.00. You must charge the sales tax, now 5% in New Jersey. It is called the rate. *The rate is always the number with the percent sign (%)*.

You are looking for the *amount to add on* to the original amount. You want to know this in dollars and cents, so you can compute the new total.

This is the most common type of percentage problem, where you know the original amount and the rate, but must find the amount to add on or subtract. You do not always add on, you know. When you get a discount, you deduct (subtract) from the original amount.

+ 5%
sales
tax   ADD ON

WORK   -10%
SHOES   discount   TAKE OFF

167

Here is a chart of a typical type-A problem:

Original amount	Rate	Amount of increase or Amount of decrease
$25.00	5%	?

TYPE-B PERCENTAGE PROBLEM

One wholesaler offers you a 15% discount off the original price of a new dishwasher (type A problem), but another wholesaler tells you he will save you 50 dollars on the list price. How do you compare the two different net prices? In the case of the second dealer he did not tell you the *rate* — the amount with the percent sign — you must figure it out yourself.

Other examples of TYPE B problems: The customer left $1.00 on a $5.00 meal. *What was the percent of the tip?*

Our business went up from $30,000 income last year to $40,000 this year. *What was the rate of increase?*

Here is a type-B problem illustrated on a chart:

Original amount, or List price	Rate	Amount of increase or Amount of decrease
$25.00	?	$1.25

Now let's put the two charts together, and look carefully at them.

	Original amount, or List price, or Catalog price	Rate (%)	Amount to be added on or taken off
A	(of) $25.00	10%	? (Multiply $25.00 by 10%)
B	(of) $25.00	% (Divide $25.00 into $2.50)	$2.50

177

We used the same amounts in both types of problems. Note how each one has something different missing.

A typical A-type problem might read: The list price was $25.00 and the discount is 10%. How much is the discount (the amount to be taken off)?

A typical B-type problem might read: A discount of $2.50 was allowed on a purchase of $25.00. What percent was it? (A B-type problem is very easy to identify because of the missing percent.)

The math operations for each type will be shown in more detail later, and you will get practice doing the problems on the following pages.

An additional comment on placing the proper numbers in the proper boxes. Place the word "of" before the first box. The number after the "of" usually goes into the first box.

10% of $25.00? ($25.00 goes into first box.)
What percent is $2.50 of $25.00? ($25.00 goes into first box)

It sometimes helps to add a box to the end of the chart to indicate the NEW PRICE. In most problems, not only must the amount to be added be found, but the new price is also required. What is the amount you must pay on a $5.00 meal if the sales tax is 5%? Rate = 5%.   5% of $5.00 = $.25.   Add $.25 to the $5.00, and you must pay $5.25.

Our $25.00 order was raised 10%, due to inflation. What is the price we had to pay?

New price

| $25.00 | 10% | Ans. $2.50 | $27.50 |

169

	Original amount	Rate	Amount of Increase or Decrease		New Price
A	(of)	$\times$ %	?		
B	(of)	$\div$? %			

The following words may be used instead of the terms above.

Regular price	Percent	Discount	Sale price
List price		Gross profit	Total price
Catalog price			
Original price			
Regularly			
Cost price			
Cost			
Base	Rate	Percentage	
Interest problems: Principal	Rate	Interest	

179

6% yearly on 2-year Savings Certificates. Interest Guaranteed to Maturity From DAY OF DEPOSIT. Compounded Quarterly. $1,000 minimum.

5% yearly. Compounded Quarterly. Highest rate permitted on Regular Passbook Savings Accounts. Withdrawals permitted any time.

P.S. 5¾ % yearly on 1-year Savings Certificate,

Using the chart, see if you can identify the following problems as to type:

1. "10% of 40" is a Type ____ problem.

2. "50 dollars is what percent of 300 dollars?" is a Type ____ problem.

ASSIGNMENT A.

Fill in the letter of the *type* of problem only (A or B):

Type

3. 8% of 30. ___ _____

4. What percent is a $2.00 tip on an $18.00 meal? ___ _____

5. 5% interest on $1,000 in the bank. ___ _____

6. A 15% discount on a $60.00 suit. ___ _____

7. I saved $1.00 on a $5.00 tie on sale. What was the percent of the discount? ___ _____

8. 45% of 450. ___ _____

9. What percent is 25 of 50? ___ _____

171

180

10. 5% sales tax on a $22.00 dinner. _____ _____

11. If the social security tax is 5.85% and you earned $100.00 last week, how much did they take out of your pay for social security? _____ _____

12. 3 is what percent of 30? _____ _____

13. You are allowed a 2% discount for paying your $500.00 food bill on time. How much do you save? _____ _____

14. A 30% discount on all old-style serving trays. The original price of the trays was $15.00 per dozen. How much do you save? _____ _____

15. We earned $15,000 last year in our business. This year we made $18,000. What is the percent increase in profit this year over last year? _____ _____

PROCEDURE — How to do type-A percentage problems:

Example 1:   Find 5% of 200

   a.   All type-A problems are *multiplication* problems.
        (Remember our hint — "of" means the original amount.)

   b.   First the 5% is changed to a decimal (.05). (Remember that a percent cannot be used to work out a problem — it must be changed to a decimal fraction or regular fraction.)

   c.   Multiply $\begin{array}{r} 200 \\ \times .05 \\ \hline 10.00 \end{array}$

   d.   Answer 10.00 or 10 (The zeros are not necessary)

   e.   Check: Does the answer seem reasonable? Yes, it does.

Example 2:   Find 35% of 942

   a.   Recognize this as a type-A problem, requiring multiplication.

   b.   Multiply $\begin{array}{r} 942 \\ \times .35 \\ \hline 4710 \\ 2826 \\ \hline 329.70 \end{array}$ (Whole amount)
        (Percent, changed to a decimal)
        329.70 Answer

   c.   Check: 35% is close to 1/3 (33%).
        329 is about 330, and this is fairly close to 1/3 of 942.
        The estimate indicates the answer is at least approximately correct.

172

Example 3: Find 25% of 250.

    a.   Recognize the need to multiply.

    b.   Recognize that 25% is equivalent to the fraction 1/4.

    c.   Decide that it is probably easier to use the fraction 1/4 than the decimal .25.

    d.   Multiply $250 \times \frac{1}{4} = \frac{250}{4} = 62\frac{1}{4}$ Answer

    e.   Is the answer reasonable? The number 250 is a little more than 240, which is evenly divided by 4, giving 60. Therefore 62¼ is at least approximately correct.

PRE-ASSIGNMENT

1. 50% of 24   _____

2. 30% of 50   _____

3. $66\frac{2}{3}$% of 18   _____

ASSIGNMENT.B:

1. 40% of 25   _____

2. 10% of 32   _____

3. 12½% of 72   _____

4. 75% of 28   _____

5. 50% of 98   _____

6. 37½% of 200   _____

7. 87½% of 56   _____

8. 90% of $45   _____

9. 12% of $64   _____

10. $33\frac{1}{3}$% of 90   _____

11. 60% of $55.50   _____

12. 25% of $1,764   _____

13. 5% of 38   _____

14. 2% of 200   _____

15. 100% of 57   _____

173

PROCEDURE – How to do type-B percentage problems:

Example 1: What percent of 40 is 8?

    a. Identify problem as to type. The percent (rate) is missing; therefore it is a Type B problem.

    b. 40 is the original amount. (Note the word "of.")
Note: It is the first number on the chart.

We are looking for the % of 40. Therefore we *divide* by the original amount: $\frac{8}{40}$

$$40\overline{)8.00}^{.20} = 20\%\quad OR\quad \frac{8}{40} = \frac{\cancel{8}^{1}}{\cancel{40}_{5}} = \frac{1}{5} = 20\%$$

    c. In a simple problem like this, it is easy to check by simply taking 20% of 40. Does it equal 8?

$20\% = .20$

$$\begin{array}{r} 40 \\ \times\ .20 \\ \hline 8.00 \end{array} = 8 \quad \text{The answer is correct.}$$

Example 2: What percent of 20 is 60?

    a. Identify type of problem as type B, which calls for division.

    b. The original amount is 20. (Note the word "of.")

    c. Divide by the original amount: $\frac{60}{20}$

$$20\overline{)60}^{3} = 3. = 300\%$$

    d. Is the answer reasonable? If you think carefully about the meaning of the problem, you will see that it is. Check the arithmetic by multiplying 20 by 3. (which is 300% converted to decimal form).

$$20 \times 3 = 60$$

PRE-ASSIGNMENT

1. $15 is what percent of $60?   _____

2. $75 is what percent of $375?   _____

3. What percent of 300 is 15?   _____

ASSIGNMENT C:

4. $20 is what percent of $160?   _____

5. $12 is what percent of $240?   _____

6. $600 is what percent of $660? _____

7. 50 is what percent of 250? _____

8. 33 is what percent of 100? _____

9. $140 is what percent of $700? _____

10. 292 is what percent of 146? _____

11. What percent of .60 is .30? _____

12. What percent of $12.00 is $2.00? _____

13. What percent of $200 is $237.50? _____

14. What percent of .75 is .50? _____

15. What percent of 50¢ is 2¢? _____

16. What percent of 50 portions is 150 portions? _____

17. What percent of $38 is $46? _____

18. What percent of $1.00 is 17¢? _____

19. What percent of $2.00 is 28¢? _____

20. What percent of 5 dollars is 5 cents? _____

ASSIGNMENT D:

1. – 15.   Work out the arithmetic for the problems on pages 171 and 172.

16. What tip might you expect on a $22 restaurant bill at a
tipping rate of 15% _____

17. The store ad said: "Special sale – chrome-plated bar
stools, regularly $49.95, on sale this week for $34.95."
What percent *markdown* is this? (Use approximate
figures to calculate.) _____

18. At 40% *off* list price, what would you pay for
glassware listed at $96 a gross? _____

19. What is the social security tax on an annual wage
amounting to $11,500 at a rate of 5.85 percent. If the
employer paid the same amount as the employee, how
much went into the social security fund altogether? _____

20. What is the discount rate if Jean paid $9.00 for a
uniform listing at $12.00? _____

21. Sue paid $6.75 for a cookbook that carried approxi-
mately a $9.95 price tag. How much did she save?
Approximately what percent did she save? _____

175

22. A cooking school advertised a "Brush-Up Special" for
$40 for 4 sessions. It claimed the sessions were usually
priced at $15 each. What percent savings was it
offering?

_____

23. Read over the ad for Rosie O'Grady's restaurant on the next page. Note
that on Wednesday, all dinners are 10% off. On Monday and Tuesday,
discounts are given on two sizes of butt steaks. Compute the percent of
discount for each (use approximate figures). Compute the approximate
percent of discount given for prime ribs on Thursday and Friday.

_____

_____

_____

Brain teaser: Snuffy's Tavern made a net profit of $37,500 last year.
This year it increased its profit by 12%. Mike's Spot made $45,000 last
year, but due to increased expenses suffered a 14% decrease in profit
this year. Which tavern made more money this year? How much more?

_____

_____

ROSIE'S...

FIGHTING INFLATION
with
DAILY SPECIALS

Monday & Tuesday	Reg.	Now
Rosie's Own Big Top Butt Steak	$5.95	$4.49
Rosie's Own Little Top Butt Steak	$4.95	$3.49

Wednesday

All dinners 10% Off!*

Thursday & Friday	Reg.	Now
Rosie's Prime Ribs of Beef	$6.75	$4.79

All Dinners Include:
Unlimited Salad Bar & Choice of Potato, Plus Individual Loaf of French Bread.

*Dinner Only. Alcoholic Beverages Not Included In Discount

A House of Great Repute

ROSIE O'GRADY'S
Beef and Booze

Route Thirty-Five, Eatontown, N.J.
Phone: Five, Four, Two-Oh, Ate, Oh, Oh!

Objective: You will learn how prices are marked up by fractions and by percents.

Related Information:

Marking up prices can be simple or complex depending upon some of the following factors: An item may have a price marked on it, set by the manufacturer. In cases like that, most retailers sell the product at the suggested price. Examples of this in a restaurant might be tobacco, candy, and gum items – probably sold at the cash register.

A second circumstance involves a type of item that is simple in nature, where we can determine the cost of each item. Examples of this might be baked goods. For example, a muffin costs us 5¢ to make, we will mark it up to 10¢. A danish costs us 10¢, and we will sell it for 25¢. An ice cream pop costs us 10¢, and we will sell it for 20¢.

A more complex situation results when we must take materials from many sources and combine them. A salad, a veal-cutlet dinner, a turkey dinner. What makes it complex is that we must figure out how much of each item is used and how much each item costs. In a salad we may have lettuce, tomatoes, mayonnaise, celery, tuna-fish, onion, etc. Even a simple sandwich may have four or five items going into it, which need to be included when computing its cost.

Back in Unit III we computed portion costs for several different menu items (see pages 101 through 113). Once we know portion costs, we are then able to apply a certain markup figure.

Some of the factors to be considered when marking up the price from the actual cost of ingredients include:

Labor –   the cost of all the people who must be employed to make the product, serve the product, keep the place clean, and manage the place.

Overhead– rent, electricity, insurance, repairs, water, furniture, taxes, etc., etc.

Profit–   A person is in business to make a profit. How much must he add on to get his profit?

There are different methods used to mark up prices. In the first instance above it was determined by the price marked on the item. In the next two cases we had to figure out the cost of the item. To this cost we add an amount to cover the items listed above: labor, overhead, and profit.

There are two simple methods which can be used: fractional and percent.

187

MARKING UP PRICES BY THE FRACTION METHOD

Example: Mark up a $1.00 cost by 1/3.

$$\text{Cost:} \quad \$1.00$$

$$\frac{1}{3} \text{ of } \$1.00$$

$$\frac{1}{3} \times \frac{\$1.00}{1} = \frac{\$1.00}{3} = .33$$

Marked up price: $1.00 + .33 or $1.33

MARKING UP PRICES USING PERCENTAGE

Example: Mark up a $2.40 cost by 33%.

(You can use your knowledge and change the percent to a fraction and proceed as above, or you can convert 33% to .33 and multiply by the decimal fraction.)

Cost: $2.40

33% of $2.40   .(Type A problem)

$$
\begin{array}{r}
\$2.40 \\
\times \quad .33 \\
\hline
720 \\
720 \\
\hline
.7920 = .79
\end{array}
$$

Marked up price: $2.40 + .79 = $3.19

ASSIGNMENT:

Mark up the following prices by the percent indicated. You may use approximations provided they are close approximations.

1.   40 ¢; 30% markup _____   6. $2.50; 1/3 markup   _____

2.   80¢; ¼ markup _____   7. $3.20; 50% markup   _____

3.   92¢; 50% markup _____   8.   8¢; 200% markup   _____

4.   85¢; 75% markup _____   9.   23¢; 150% markup   _____

5. $1.25; 33% markup _____   10. $25.98; 15% markup   _____

11. $145.00; 25% markup   _____

12. 65¢; 125% markup   _____

13. 18¢; 1/3 markup   _____

14. 27¢ 200% markup   _____

15. 35¢; ½ markup   _____

16. $1.98; 33% markup   _____

17. $4.13; 75% markup   _____

18. $5.23; 100% markup   _____

180

UNIT V — PERCENTAGE

Objective: You will learn to figure simple interest on money borrowed.

Related Information:

When you borrow money from a bank or loan company you must pay a certain amount, called *interest*, for the use of this money. The original amount of money you borrow is called the *principal*. Businessmen often have to borrow money. When they start a business or buy a business from someone, they may have to make a loan. When they want to enlarge or improve their business, they may have to seek extra funds. Although it costs money to borrow money, if your business is successful you should be able to pay the money back with interest.

When you borrow money you want to know the amount of interest you must pay. The amount of interest will depend on *how much* you borrow, *how long* you keep the money, *how you pay it back*, and the *rate of interest*. *Rate of interest* means a certain percent of the principal for one year. You can borrow money for one year, two years, three years, or longer. Homeowners have mortgages that may take 20 or 30 years to pay back, and they pay interest over the entire period.

Businessmen usually borrow from banks, and they pay *simple interest* on a loan. The loan comes due at a certain time, and they pay it back at that time plus a certain percent of the loan (the interest rate) for each year.

There are many other ways of borrowing money. You may borrow from a bank or finance company (loan company) and pay a certain amount back each month, plus an interest charge on the money not yet paid back. Or the interest amount can be figured out in advance and then deducted *(discounted)* from the amount you receive, which you then pay off at a certain amount each month. For these loans it takes extra arithmetic to calculate the *true annual interest*.

We will deal only with loans that are paid off in one payment, at a stated (true) annual rate.

Think of the terms principal, rate, and interest the same way as you did for the typical percentage problem:

Principal	Rate	Interest
(the original amount you borrow)	%	(the amount added on that you must pay back)

181
190

Example 1: You borrow $500 for one year at the rate of 10% (Type A)

$$\begin{array}{r} \$500 \\ \times\ \underline{.10} \\ \$50.00 \end{array}$$ Change the percent to a decimal.

$50.00 Multiply as in all type-A problems

Example 2: You borrow $500 for 3 years at the rate of 10% per year.

Get the interest for one year, as in problem 1 above. Then multiply your answer by 3.

3 × $50.00 = $150.00   Remember, the rate is 10% *per year*. Since you are borrowing the money for three years, you must pay 10% interest for each year of the loan.

Example 3: You borrow $500 for 3 months at the rate of 10% per year.

The year is divided into 12 months. You are borrowing the money for 3 months out of 12, or 3/12 of a year.

$$\frac{3}{12} = \frac{1}{4}$$

Interest cost for a full year = $50.00 (Found as in problem 1.)

$\frac{1}{4}$ of $50.00   Will give you the interest cost for 3 months.

$$\frac{1}{4} \times \frac{50}{1} = \frac{50}{4} = 12\frac{2}{4} = 12\frac{1}{2} = \$12.50$$

Therefore you pay $12.50 for borrowing $500 for 3 months at 10%.

You can change days into months:

60 days equals 2 months = 2/12 of a year

$$\frac{2}{12} = \frac{1}{6}$$

You can also use days as follows: $\frac{60\ \text{days}}{360\ \text{days}}$ (used for a whole year)

This also reduces to $\frac{1}{6}$

In either case you would take $\frac{1}{6}$ of the interest for a year.

You can find the *rate* by following the same procedure you used in doing type-B percentage problems.

191

182

ASSIGNMENT:

1. Find the annual interest for the following loans:

Amount borrowed (principal)	Rate	Interest
a. $350	8%	_____
b. $425	10%	_____
c. $225	10%	_____
d. $4500	8%	_____
e. $10,000	9%	_____
f. $2,250	6½%	_____

2. Find the interest on the following loans:

Amount of loan	Rate	Time	Interest
a. $650	8%	3 years	_____
b. $1250	9%	2 years	_____
c. $20,000	8%	20 years	_____
d. $8,500	10%	3 years	_____
e. $4,000	9½%	3 years	_____

3. Find the interest on the following loans:

Principal	Rate	Time	Interest
a. $750	8%	6 months	_____
b. $430	10%	9 months	_____
c. $1,200	9%	3 months	_____
d. $420	8½%	4 months	_____

192

4. Find the annual rate of interest on the following problems:

Principal	Interest	Time	Rate
a. $540	$43.20	1 year	_____
b. $350	$21.00	1 year	_____
c. $800	$68.00	1 year	_____
d. $1,200	$120.00	1 year	_____
e. $3000	$480.00	2 years	_____
f. $460	$124.20	3 years	_____
g. $200	$17.00	1 year	_____
h. $5000	$900.00	3 years	_____

5. Find the annual rate of interest for the following loans:

Amount borrowed	Time	Amount paid	Rate
a. $300	6 mos.	$318.00	_____
b. $150	90 days	$153.00	_____
c. $200	6 mos.	$206.00	_____
d. $200	3 mos.	$206.00	_____
e. $80	30 days	$81.00	_____
f. $674	60 days	$680.74	_____

6. Mr. Gerber borrowed $6,000 from the bank for 6 months at 8%. How much interest did Mr. Gerber pay? _____

7. A $1,300 loan was necessary if we wanted to replace the tables and chairs in our restaurant. At 8½%, how much interest would we pay on a 2-year loan? _____

193

8. A stainless-steel-top worktable costs $1,354.00. At an annual rate of 8%, what would the interest amount to if I took out a loan for 6 mos? for 1 year? for 18 months?

9. A dishwasher unit costs $2400. The amount of interest came to $216 for 1 year. What was the rate?

10. A roasting oven with a stainless-steel finish costs $650. At an annual rate of 10%, what would the interest amount to on a 3-month loan?

11. A restaurant fryer, stainless-steel finish all over, costs $438. At 9% annual rate, what would the interest amount to for 6 months?

12. The Rusty Nail restaurant is paying 8½% on a $24,000 mortgage. If the mortgage runs for 20 years, how much will the interest amount to? How much money in all (principal and interest) will the owner have to pay over that period?

185

Objective: You will learn how discounts are calculated in the food service industry.

Related Information :

People in the restaurant or food-preparation business purchase food from wholesalers or direct from the factory that makes the food, supplies, or equipment. The purchases made by a restaurant are usually in large quantities.

A wholesaler saves money when he sells in large quantities. It may cost him very little more to assemble and ship a large order than a small order. Many wholesalers pass some of these savings along to those who order in large quantities, and this encourages businesses to buy in larger quantities. Discounts from list prices for quantity purchases are called *quantity discounts.*

Wholesalers also encourage businessmen to pay their bills promptly by offering *trade discounts.* If a buyer pays the bill before a certain date he may deduct a certain percent from the amount, usually 2%.

Example 1: A restaurant buys 8 loaves of bread a day (2-lb. white loaf). The regular or list price is 55¢ per loaf. Because the restaurant buys large quantities it is given a 10% discount. Compute the cost of a 30-day supply of bread.

8 loaves X 30 days = 240 loaves

240 X .55 = $132.00

At a 10% discount: 132.00
                        X .10
                      $13.2000 = $13.20 discount

$132.00 — $13.20 = $118.80 Answer

The business world uses a simple code system to describe the conditions under which you can receive a discount for paying your bills early or on time.

Terms: 2/30 n/31

the 2 stands for 2% discount

the 30 means 30 days: you will get a 2% discount if you pay your bill within 30 days.

n means net: you will pay the regular amount (no discount) if you pay after 30 days. (You may be subject to a penalty if you take too long to pay.)

Example 2:   An item was purchased for $200.00, terms: 2/30 n/31. If the bill was paid within 30 days from date of billing, how much was paid?

$$\begin{array}{r} \$200.00 \\ \times \ \ .02 \\ \hline \$2.0000 \end{array} \qquad \begin{array}{r} \$200.00 \\ - \ \ 2.00 \\ \hline \$198.00 \ \ \text{Answer} \end{array}$$

(The discount may be small, but every bit helps the businessman!)

Example 3:   Some restaurants purchase equipment on a "cost plus 10%" arrangement. This means that whatever it costs the wholesaler or manufacturer, he sells it for 10% more. He takes a markup of only 10% on the sale.

A stainless-steel dishwasher cost the equipment distributor $1,850. He agrees to sell it to you on a cost-plus-10% arrangement because you are a good customer.

$$\begin{array}{r} \$1,850 \\ \times \ \ .10 \\ \hline \$185.00 \end{array}$$

$1,850 plus $185 (10%):

$$\begin{array}{r} \$1,850.00 \\ + \ \ \ 185.00 \\ \hline \end{array}$$

Cost to you $2,035.00

ASSIGNMENT A:

1. A medium-weight aluminum saucepan costs $5.60. What price would you have to pay with a 10% trade discount?

1. If 2½-quart pitchers cost $2.25 each, and you purchased 1 dozen, what was your price with a 10% trade discount? How much money did you save?

3. Anodized aluminum pitchers cost $2.95 each in lots of 12 or more. In smaller quantities they cost $3.25 each. What percent do you save by buying the pitchers in lots of 12 or more?

4. You purchased the following items:
   1 8-oz ladle, $1.40 ea.
   2 16-oz ladles, $2.40 ea.
   1 perforated-bowl spoon, $1.25 ea.
   1 13" serving fork, $1.40 ea.
   What was the total bill? How much would these items cost you with a 10% discount? How much would you save with the discount?

5. Quantity discount:
   12 pieces — less 10%
   13 to 35 pieces — less 15%
   36 or more pieces — less 20%

187

You purchased   4 solid spoons, $2.80 each   Cost _____
                  12 slotted spoons, $2.80 each   Cost _____
                  24 utility knives, $2.60 each   Cost _____
                  48 pie servers, $3.60 each   Cost _____

Total cost _____

6. The price in the catalog on deep ladles is $4.60 each. In cartons of six or more they are $4.40 each. What is the percent discount on cartons of six or more for each ladle?

7. A deluxe full-size chafer costs $45.00 (list price). What will it cost me with a 15% discount?

8. A commercial can opener costs $15.75. What will my price be with a 5% discount?

9. Ten-gallon plastic storage cans cost $3.00 each. If I purchase four, the price is only $2.50 per can. What percent discount will I receive?

ASSIGNMENT B:

1. A portable vegetable peeler costs $225.00. The terms of your purchase are 2/30 n/31. You paid your bill 15 days after the date on the invoice. Did you get a discount? If so, how much?

2. A gravity-feed slicer lists at $350.00. The terms are 2/30 n/31. Assume you paid the bill within the 30 days. How much did the slicer cost you?

3. A 1-gallon commercial blender lists at $295.00. Terms are 2/30 n/31. It was 40 days from the date of the invoice when you paid your bill. How much did you pay?

4. A 22-quart food mixer lists at $595.00. Terms are 2/30 n/31. Your invoice is dated July 15, and you paid the bill on August 10. Did you receive a discount? How much? What did the mixer cost you?

197

ASSIGNMENT C:

The cost to the wholesaler for each of the following items is given. You buy the items on a cost-plus-10% basis. Determine how much each item costs you.

1 45-qt S. S. mixing bowl, $60.00   _____

1 3-shelf utility cart, $34.00   _____

12 fiberglass trays at $22.20 a dozen   _____

4 dozen fiberglass trays at $22.20 a dozen   _____

1 gross sherbets at $6.60 per dozen   _____

200 juice glasses at $1.20 per dozen   _____

2 gross cups at $4.40 per dozen   _____

198

UNIT VI – RATIO AND PROPORTION

Objectives: You will learn the meaning of ratio.
                You will be able to simplify ratios to lowest terms and change ratios to fractions.

Related Information:

        Ratio and proportion are important mathematical ideas which will enable you to quickly find solutions to problems involving price markups and recipe changes.

        A ratio is the *comparison of one item to another*.

        In proportion you work with two ratios. Proportion will be dealt with in the next lesson.

        We may compare any two (or more) things that have weight, size, or numbers and thereby set up a ratio between them.

        We will compare the number of cups to the number of saucers shown here:
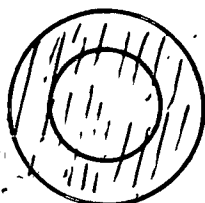
                                                            1 cup

                                                                    The ratio is 1 to 1.

                                                            1 saucer

        Now compare the number of cups to the number of saucers shown here:
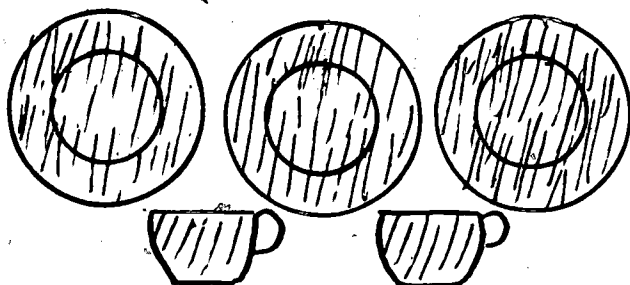
                                                            3 saucers

                                                                    The ratio is 2 to 3.

                                                            2 cups

        What we did was to count up the number of cups (2) and compare this number with the number of saucers (3).

        We can indicate the ratio this way: 2 : 3. The : sign means "is to."

        We are saying "two is to three," or simply "two to three."

        A complete sentence would read: "The ratio of cups to saucers is two to three."

190

We can also reverse the relationship by comparing the number of saucers to the number of cups, in which case we would have 3 to 2.

Ratios can also be written as fractions. The number after the colon or the word "to" is the denominator. The first number is the numerator.

Example 1:   1 : 3 can also be written as the fraction $\frac{1}{3}$.

Example 2:   5 : 10 can be written $\frac{5}{10}$, which, as you know, reduces to $\frac{1}{2}$.

Example 3:   12 : 4 equals $\frac{12}{4}$, which reduces to $\frac{3}{1}$.

A ratio, then, is a comparison of two things. If we are to compare things, we must be sure they are expressed *in the same units*.

We *can* compare 12 cups to 4 saucers. (Each is a count of individual things or units).

We *can* compare 3 inches to 18 inches.

We *can* compare 2 ounces to 8 ounces.

. . . . because the units are the same.   BUT . . . .

We *cannot* compare 1 *dozen* cups to 4 saucers without first changing the 1 dozen to units (12), or changing the 4 saucers to a fractional part of a dozen (1/3).

We can compare dozens to dozens or units to units, but not units to dozens.

We can compare inches to inches, yards to yards, feet to feet, but not yards to inches or feet to yards.

PROCEDURE: While it is possible to talk about a ratio such as 50 : 100, we generally reduce the numbers to lowest terms.

50 : 100   Look for the largest number that will divide evenly into both terms of the ratio.

10 seems to suit both sides of the ratio. Divide both sides by 10.

$\frac{50}{10}$: $\frac{100}{10}$ 10 into 50 = 5
                     10 into 100 = 10

5 : 10   (Note: we did not pick the largest number; 50 would have been better. So we must continue to reduce.)

$\frac{5}{5}$: $\frac{10}{5}$ 5 into 5 = 1
                     5 into 10 = 2

Answer 1 : 2

191
200

Note that a ratio need not have *any* units. It is just a mathematical idea. If we compare 3 inches to 18 inches, we could write

$$3 \text{ inches} : 18 \text{ inches}$$

These are *denominate numbers* (see page 28). In order to simplify this expression, we can divide both quantities by *3 inches*:

$$3 \text{ inches} : 18 \text{ inches}$$

$$\frac{3 \text{ inches}}{3 \text{ inches}} : \frac{18 \text{ inches}}{3 \text{ inches}}$$

$$\frac{\cancel{3} \text{ inches}}{\cancel{3} \text{ inches}}_1^1 : \frac{\cancel{18} \text{ inches}}{\cancel{3} \text{ inches}}_1^6$$

We end up with a ratio of 1 : 6. Just 1 to 6 — no units at all. So the ratio of 3 inches to 18 inches is 1 to 6. These are *pure numbers*, not denominate numbers.

In an election, you might have candidate A getting 4000 votes (approximately), and candidate B getting 3000 votes (approximately). What is the ratio of the votes?

$$4000 \text{ votes} : 3000 \text{ votes}$$

This may be simplified to

$$4 : 3.$$

This means just the *relationship between the numbers 4 and 3*. We may say that Mr. A won over Mr. B by a ratio of 4 to 3.

PRE–ASSIGNMENT: Change to the simplest ratio.

1. 2 inches to 6 inches _____   2. 9 lbs to 6 lbs _____

3. 3 : 12 _____   4. 6 : 16 _____

5. 8 : 10 _____   6. 7 : 8 _____

ASSIGNMENT A. Express these ratios in lowest terms:

1. 2 to 8 _____   6. 12 to 10 _____

2. 3 to 15 _____   7. 15 : 45 _____

3. 24 : 48 _____   8. 50¢ to 75¢ _____

4. 9 to 12 _____   9. 20 to 100 _____

5. 15 to 25 _____   10. 5 to 75 _____

ASSIGNMENT B:

1. The ratio of 15 to 5 is the same as ____ to 1

2. The ratio of 21 to 3 is the same as ____ to 1

3. The ratio 8 to 6 is the same as ____ to 3

4. The ratio 12 to 10 is the same as ____ to 5

5. The ratio 18 : 24 is the same as 3 to ____

ASSIGNMENT C: Change to ratios in lowest terms:

1. 1 lb to 8 oz ____

2. 1 gal to 2 qts ____

3. 10 min to 1 hr ____

4. 1 gal to 1 pt ____

5. 2 ft to 8 in ____

6. 4 yds to 2 ft ____

7. $2.00 to 75¢ ____

8. 50¢ to $3.00 ____

ASSIGNMENT D: Express the following ratios as fractions reduced to lowest terms.

1. 9 to 12 ____   6. $1.25 to 6.25 ____

2. 48 to 72 ____   7. 30 to 60 ____

3. 16 to 48 ____   8. 3 dimes to 2 quarters ____

4. 15 to 20 ____   9. 25 mins to 3 hr ____

5. 13 to 52 ____   10 24 to 36 ____

ASSIGNMENT E: Complete the ratio column in the chart on page 164.

Additional problems in ratio:

So far the problems with ratio have been simple. To summarize, we have:

1. Compared items and reduced them to lowest terms. 8¢ to 24¢ = 1 to 3

2. Changed items if they were in different units and then simplified.

25¢ to $2 = 25¢ to 200¢   (or .25 to 2.00)

= 1 to 8   or   1 : 8

Ratio can also help us solve certain other types of problems.

Example 1: Two business partners divide their profits in a 4 to 1 ratio. What is each partner's share if the business earned $2000 for the month?

The ratio is 4 to 1, which means one man gets four parts and one man gets one part. *Together they get 5 parts.*

Divide the 5 into the $2000 = $400

The first man, who gets 4 parts: 4 X $400 = $1600

The second man, who gets 1 part: 1 X $400 = $ 400

To check, total up both shares $2000

Example 2: In a class of 20 students, the ratio of boys to girls is 3 to 1. How many boys are in the class?

The ratio is 3 to 1.

Add the 3 to the 1, to get 4 parts in all.

Divide: 4 into 20 = 5

Multiply the boys' part (3) by 5 = 15 — the number of boys

Multiply the girls' part (1) by 5 = 5 — the number of girls

To check, add: 20 — total number of students

PRE-ASSIGNMENT F:

1. Two business partners divide their profits in a 3 to 2 ratio. What is each partner's share if one month the profit came to $3000?

ASSIGNMENT F:

1. A man and his son earn $150 per week. The ratio of their earnings is 5 to 1. What does each earn per week?

2. In a restaurant with 26 workers, 15 work part time and 11 work full time. Give the ratio of:
    a. The number of part-timers to full-timers.
    b. The number of part-timers to the full staff.

3. Two business partners divide their profits in a 3 to 5 ratio. Find each partner's share of a profit amounting to $10,000.

203

4. Three people went into the restaurant business and put up $30,000. The ratio of their investments was 3 to 2 to 1. How much cash did each put up?

5. A recipe for fish salad calls for 2 cups of celery, cut fine, and 2 cups of cooked fish, flaked. What is the ratio of celery to fish?

6. A woman and her daughter earn $320 per week. The ratio of their earnings is 5 to 3. How much does each earn per week?

7. A recipe for Thousand Island dressing calls for 3 quarts of mayonnaise and 3 cups of chili sauce. What is the ratio of chili sauce to mayonnaise?

8. The busboys in the Chesapeake Restaurant share the waiters' tips on a 1 to 2 basis. If the waiters collected $141.60 one evening, how much did the busboys receive?

9. For an oil-vinegar dressing, most recipes call for a 3 to 1 ratio of oil to vinegar. How much oil would be used in a dressing made with 2 cups of vinegar?

10. A weak brine for pickling beets was to be prepared with a 3:2 ratio of vinegar to water. To get 2½ quarts in all, how much of each ingredient would be needed?

204

195

Objectives:.   You will learn the meaning of proportion.

You will be able to complete proportion problems.

You will be able to set up a proportion to solve problems in the trade.

Related Information:

We use the concept of proportion in our everyday language without realizing we are expressing a mathematical relationship. We may speak of a young lady or young man as being well built or well *proportioned*. When we prepare a platter and put on different ingredients, the portions of each item have a definite relation to each other and to the whole. The well-prepared platter has the proper proportions.

Proportion is a short way of saying that *two ratios are equal*. Below are sketches of two people. Although B is taller than A, his arms and legs are in the same proportion.

and
$$\frac{\text{Arms of A}}{\text{Height of A}} = \frac{\text{Arms of B}}{\text{Height of B}}$$

$$\frac{\text{Legs of A}}{\text{Height of A}} = \frac{\text{Legs of B}}{\text{Height of B}}$$
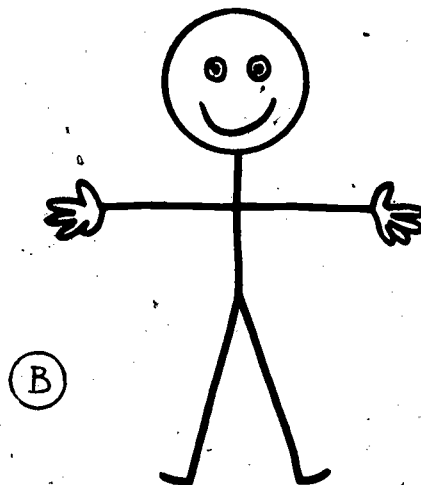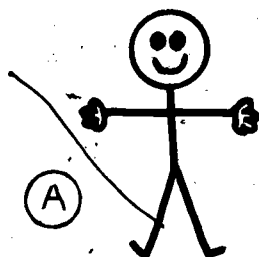
Below are sketches of two sets of cups and saucers. Are they in proportion?
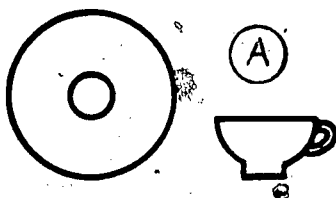
Certainly not. Cup B is much larger *in proportion to* the size of its saucer than cup A.

$$\frac{\text{Size of cup A}}{\text{Size of saucer A}} \quad \text{does not equal} \quad \frac{\text{Size of cup B}}{\text{Size of saucer B}}$$

In the above example we are not saying A cup is bad, or B cup is bad, but artistically we have developed a sense of proportion, and we make judgments about people and things based upon this sense.

196

While proportion is subject to artistic interpretation, it is also a very useful mathematical tool for working problems. We can use the concept in the trade to solve problems of *enlarging* or *decreasing* recipes.

Sometimes we even use proportion in math without realizing it.

Example: If you work 8 hours and received $12 in pay, what would you receive if you worked 4 hours?

You probably noticed that 4 is half of 8 and therefore you took half of $12 and came up with an answer of $6.

Not all problems are solved so readily, just by juggling a few numbers in your head. But all of this type and many others can be solved by a proportion. We set up two ratios that are equal to each other.

$$\frac{8 \text{ hours}}{12 \text{ dollars}} = \frac{4 \text{ hours}}{? \text{ dollars}}$$

$$\frac{8 \text{ hours}}{12 \text{ dollars}} = \frac{4 \text{ hours}}{? \text{ dollars}}$$

Cross multiply: $12 \times 4 = 8 \times ?$

$$48 = 8 \times ?$$

$$\frac{48}{8} = ?$$

$$\$6 = ?$$

(We will explain the math process again later on in more detail)

Check: $\frac{8 \text{ hours}}{12 \text{ dollars}} = \frac{4 \text{ hours}}{6 \text{ dollars}}$

$$\frac{8}{12} = \frac{2}{3} \qquad \frac{4}{6} = \frac{2}{3}$$

$$\frac{2}{3} = \frac{2}{3} \text{ is true}$$

This check tells us that we did the mathematical work correctly, but if we had made a mistake in setting up the original proportion, this check would not catch the error. In addition to checking the math, therefore, look back at your original problem and *make sure that the answer makes sense!*

There is more than one way to solve problems by proportions. For example, we might have set up this proportion for the problem above:

$$\frac{4 \text{ hours}}{8 \text{ hours}} = \frac{? \text{ dollars}}{12 \text{ dollars}}$$

or even $\frac{8 \text{ hours}}{4 \text{ hours}} = \frac{12 \text{ dollars}}{? \text{ dollars}}$

Any one of these proportions would have given us the same answer.

What you must do in setting up a proportion to solve a problem is make sure that *the relationship between the two figures to the left of the equals sign is the same as the relationship to the right of the equals sign.* Otherwise you might end up as we did with the cups on the previous page — just plain wrong.

Remember our definition: Proportion is two ratios that are equal.

Proportion provides us with an easy way to enlarge or reduce a drawing. This technique may be useful in decorating the restaurant or shop and in related art. The new drawing will look like the old drawing because it has the same *proportions.* The ratio of height to width in the large drawing will be the same as the ratio of height to width in the small drawing. (See page 203.)

Now let's learn a little more about solving proportions.

Proportions can be written in three ways:

$$1 : 3 :: 4 : 12 \qquad \text{or} \qquad 1 : 3 = 4 : 12 \qquad \text{or} \qquad \frac{1}{3} = \frac{4}{12}$$

They all are read as follows:

"One is to three as four is to twelve."

A proportion has four terms:

1st term   *3rd term*

$$\frac{1}{3} = \frac{4}{12}$$

2nd term   *4th term*

$$\underset{\textit{1st term}}{1} \quad : \quad \underset{\textit{2nd term}}{3} \quad = \quad \underset{\textit{3rd term}}{4} \quad : \quad \underset{\textit{4th term}}{12}$$

The 1st and 4th terms, occupying the beginning and end positions of the proportional statement, are called the *extremes.* The 2nd and 3rd terms, being in the middle, are called the *means.*

EXTREMES

$$1 : 3 \rightleftharpoons 4 : 12$$

MEANS

In this case the extremes are the largest and smallest numbers (1 and 12). The means are the two middle-size numbers (3 and 4). The proportion would be just as correct if the means and the extremes were interchanged. Try it and see.

THE RULE: In a *true proportion,* the product of the means equals the product of the extremes.

2υ7

PRE-ASSIGNMENT:

If the product of the means does *NOT* equal the product of the extremes, the proportion is not a true one. Which of these are true and which are not true proportions?

			Answer
1. 3 : 9 = 12 : 36	3 X 36 = 108	9 X 12 = 108	True
2. 2 : 7 = 8 : 28			
3. 3 : 20 = 6 : 40			

ASSIGNMENT A:

1. 1 : 6 = 5 : 30			
2. 3 : 8 ≠ 1.5 : 4			
3. 3 : 5 = 4 : 8			
4. 3 : 9 = 5 : 15			
5. 4 : 3 ≠ 8 : 6			

ASSIGNMENT B: (True or not-true proportions):

1. 1 : 2 ≠ 5 : 10			
2. 7.5 : 3 = 5 : 2			
3. 5 : 8 = 2 : 3			
4. 2 : 7 = 6 : 21			
5. 2 : 5 = 10 : 25			
6. Example: $\frac{10}{15} = \frac{20}{30}$	10 X 30 = 300	20 X 15 = 300	True
7. $\frac{2}{9} = \frac{10}{45}$			
8. $\frac{27}{81} = \frac{1}{3}$			
9. $\frac{2}{5} = \frac{5}{15}$			
10. $\frac{3}{6} = \frac{10}{25}$			

In the above problems you were given all the numbers and had to decide whether or not they were true proportions.

Now you are going to learn how to solve a proportion problem when you do not know one of the numbers.

A proportion is an *equation*, and if you know all the parts of an equation except one, you can figure out the missing one. You can call the unknown or missing number x or N. Then you *solve the equation* for x or N.

Example: Solve for x:

$$\frac{2}{5} = \frac{x}{15}$$

208

199

RULE: In a true proportion the product of the means equals the product of the extremes.

The means are 5 and x. Therefore we multiply 5 X x. We indicate the multiplication by just writing them next to each other: 5x.

The extremes are 2 and 15. Therefore we multiply 2 X 15, which equals 30.

$5x = 30$ Now divide both sides by 5 so we can get just 1 times x.

$\dfrac{5x}{5} = \dfrac{30}{5}$ 5 goes into 5 once
5 goes into 30 six times

Answer: $x = 6$

Check in the original equation:

$\dfrac{2}{5} = \dfrac{6}{15}$ $2 \times 15 = 30$
$5 \times 6 = 30$

Therefore this is a true proportion and the answer x = 6 is correct.

Note: It does not matter where the x is; solve the problem the same way.

PRE-ASSIGNMENT C: Solve for the missing number:

1. $\dfrac{7}{8} = \dfrac{14}{x}$ _____

2. $15 : 24 = x : 8$ _____

3. $\dfrac{5}{9} = \dfrac{x}{27}$ _____

ASSIGNMENT C: Solve for the missing number:

1. $\dfrac{6}{x} = \dfrac{2}{12}$ _____

2. $\dfrac{6}{14} = \dfrac{x}{7}$ _____

3. $\dfrac{x}{7} = \dfrac{8}{28}$ _____

4. $\dfrac{6}{90} = \dfrac{x}{15}$ _____

5. $\dfrac{x}{15} = \dfrac{12}{18}$ _____

6. $\dfrac{5}{8} = \dfrac{25}{N}$ _____

7. $\dfrac{1}{4} = \dfrac{N}{100}$ _____

209

8. $\frac{3}{7} = \frac{12}{N}$

9. $\frac{x}{15} = \frac{4}{5}$

10. $\frac{\frac{1}{2}}{8} = \frac{x}{24}$

11. $\frac{1.5}{9} = \frac{x}{30}$

12. $\frac{12}{x} = \frac{4}{3}$

13. $2 : 9 = 5 : x$

14. $3 : 3 = 75 : x$

USING PROPORTION TO SOLVE TRADE PROBLEMS

Example: John earns $2.00 per hour. How much will he earn in 8 hours?

SOLUTION: You can see that the *ratio* of John's pay to the number of hours he works remains constant. That is, if he works twice as long, he gets paid twice as much, and so on. We know how much he gets for working one hour. We want to know how much he gets for working 8 hours. We can do this problem by setting up a proportion where both ratios consist of the relationship of the number of *hours* to the number of *dollars*. We can make *either* the hours *or* the dollars the numerators — but we must *make both ratios the same way.*

$$\frac{1 \text{ hour}}{2.00} = \frac{8 \text{ hours}}{x \text{ dollars}}$$

$$1 \times x = 8 \times 2$$

$$x = 16$$

$$= \$16.00 \text{ for 8 hours}$$

Example: Joan earns $14.00 for 8 hours' work. How much will she earn in 16 hours?

Solution: *Dollars* to *hours* equals dollars to hours.

$$\frac{\$14}{8 \text{ hrs}} = \frac{x \text{ dollars}}{16 \text{ hrs}}$$

$$8 \times x = 14 \times 16$$

$$8x = 224$$

$$x = 28$$

$$= \$28.00 \text{ Answer}$$

210

Example: Change the following recipe: 10 oz of flour is used in a recipe for 12 people. Convert the recipe to serve 9 people.

$$\frac{\text{ounces}}{\text{portions}} = \frac{\text{ounces}}{\text{portions}}$$

$$\frac{10}{12} = \frac{x}{9}$$

$$10 \times 9 = 12 \times x$$

$$90 = 12x$$

$$x = 7\frac{1}{2}$$

Therefore 7½ oz should be used to prepare 9 portions.

ASSIGNMENT D:

1. A cafeteria sells for 40¢ an item that costs 25¢. At the same rate of markup, what would be the selling price of an article that costs 35¢? _____

2. A student is paid $3.00 for 2 hours' work. How much will he be paid for 9 hours' work? _____

3. In our recipe we need 40 lbs of meat for 100 persons. How many pounds would be needed for 75 people? _____

4. In our recipe we need 8 lbs of potatoes for 25 people. About how many pounds would be needed for 12 people? _____

5. In our recipe we need 5 gallons of water for a soup to feed 100 people. How much do we need to feed 25 people? _____

6. If 5 pounds of potatoes cost 60¢, how much will 3 lbs cost? _____

7. If one dozen stainless steel serving pieces costs $2.40, how much will six dozen cost? _____

8. If one dozen plastic serving bowls costs $9.00, how much will 6 bowls cost? _____

9. If 5 pounds of onions cost 59¢, how much will 12 pounds cost? _____

10. If flour costs $1.80 for 10 lbs, how much will ½ pound cost? _____
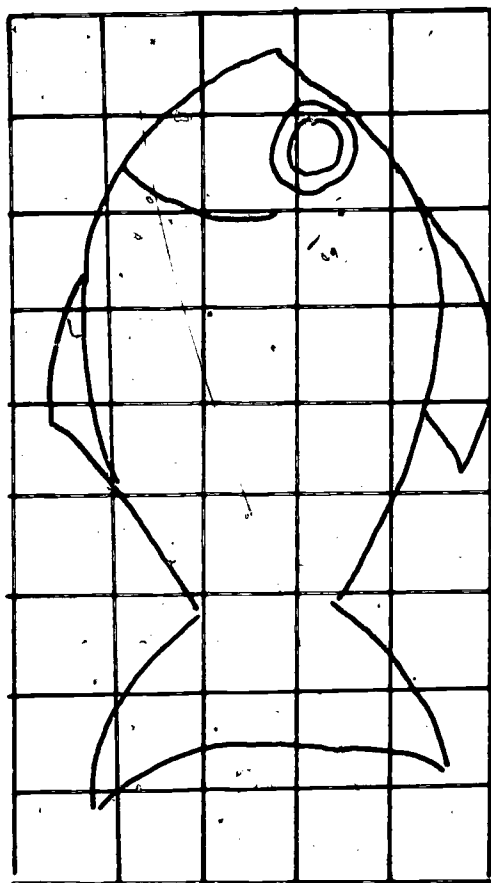
"ALL THE FISH YOU CAN EAT TODAY"

½-inch squares

Size of fish 2½ × 4

Half-inch squares have been drawn to suit the size of the picture....could have been ¼" or ¾" or 1" squares.

To enlarge, decide how large you want your fish.

Ours is 4" × 6", but we could have made it any size.

½" to 1" squares would have *doubled* the measurements.
(Ratio of 1 half to 2 halves give a ratio of 1 : 2.)

½" to 2" squares would have quadrupled the measurements.
(Ratio of 1 half to 4 halves = 1 to 4.)

Our size for the squares is ¾".
The ratio of ½ to ¾ is 2-fourths to 3-fourths. This gives us a ratio of 2:3.

The box lines help you determine where to draw the lines of the fish. The trick is to note where the fish lines cross the box lines.
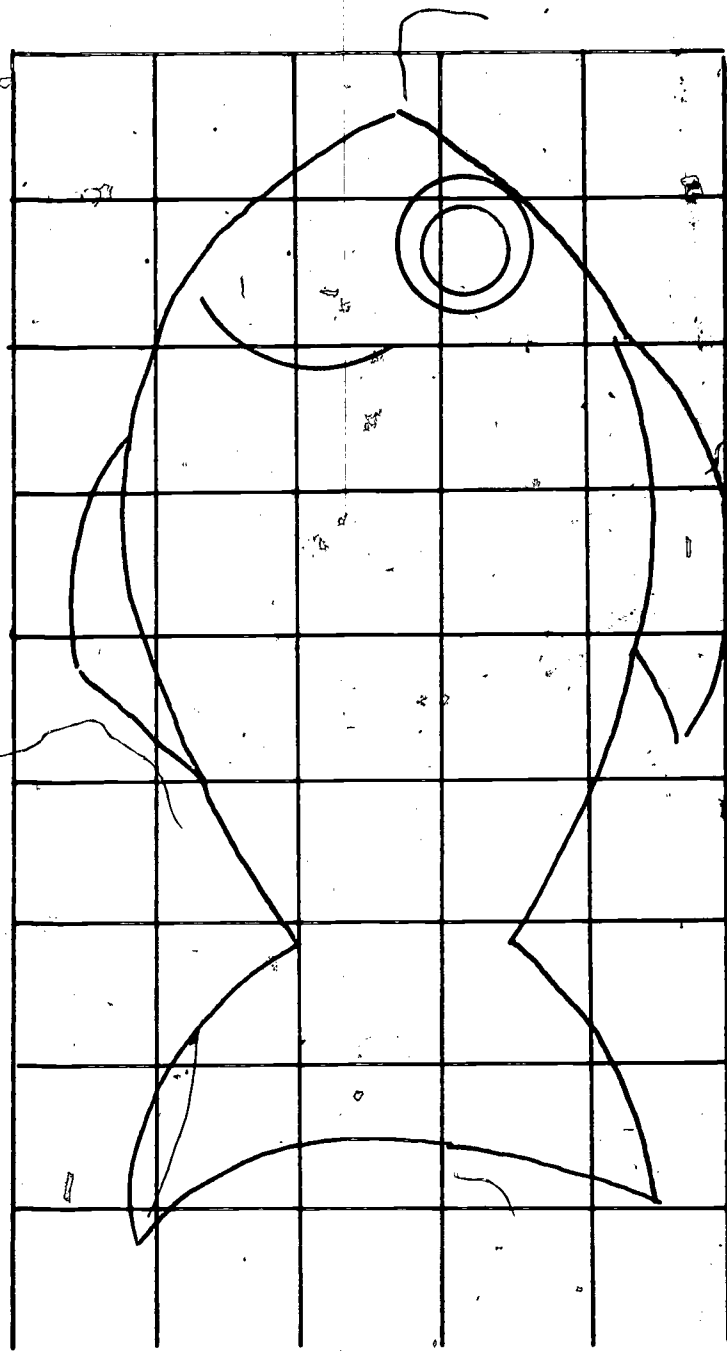
ASSIGNMENT E: Converting recipes by the use of proportion.

You have had experience in converting recipes to different quantities both by the use of simple multiplication and by the use of fractions. Now you will practice converting them by setting up proportions. Do not hesitate to use reasonable approximations (as for spices). Also, use realistic units based on your own experience.

1. **Shish Kebab**   Yield, 20 portions.   Change to 25 portions.
   Ingredients

Lamb	5 lbs	_____
Tomatoes ¾" slices	40 pieces	_____
Mushroom caps	40 pieces	_____
Pearl onions	40 pieces	_____
Green pepper	40 pieces	_____
Marinade:		
Salad oil	2 pts	_____
Olive oil	1 pt	_____
Vinegar	12 oz	_____
Lemon juice	4 oz	_____
Garlic, chopped	2 T	_____
Salt	2 T	_____
Pepper	2 t	_____
Marjoram	½ t	_____
Thyme	½ t	_____
Oregano	½ t	_____

2. **Fried Chicken Maryland**   Yield, 50 portions.   Change to 65 portions.
   Ingredients

Chickens (2¼ to 2½ lb ea)	25	_____
Bread flour	2 lb	_____
Salt and white pepper to taste		
Eggs, whole	6	_____
Milk	1 qt	_____
Bread crumbs	2 lbs	_____
Salad oil	1 qt	_____
Cream sauce	1 gal	_____
Tomato sauce	1 gal	_____
Bacon slices (crisp)	100	_____
Corn fritters	50	_____
Powdered sugar	as needed	_____

204

3. **Broiled Halibut with Lobster-Newburg Sauce**

Ingredients	Yield 50 portions	Change to 75 portions
Halibut, 6-7 oz boneless portions	50	_____
Boiled lobster meat	3½ lbs	_____
Butter	6 oz	_____
Paprika	2 t	_____
Light cream sauce	3 qt	_____
Dry sherry	4 oz	_____
Salt	to taste	_____
Pepper	to taste	_____
Lemon juice	from ½ lemon	_____
Monosodium glutamate	1 T	_____

4. **Roast Loin of Pork**

Ingredients	Yield 50 portions	Change to 35 portions
Pork loins	approx 30 lbs	_____
Salt and pepper	to taste	_____
Rosemary	2 t	_____
Mirepoix:		
Onions	1 lb	_____
Celery	½ lb	_____
Carrots	½ lb	_____
Bread flour	10 oz	_____
Chicken or beef stock	5 qt	_____

5. **Hungarian Veal Goulash**

Ingredients	Yield 50 portions	Change to 90 portions
Veal, boneless	17 lbs	_____
Oil	2 cups	_____
Onions	6 lbs	_____
Hungarian paprika	½ cup	_____
Bread flour	1 lb	_____
Sachet bag:		
Caraway seeds		
Bay leaf		
Parsley stems		
Brown stock	2 gal	_____
Tomato puree	1 #2½ can	_____
Salt	to taste	_____
Sour cream	1 qt	_____

UNIT VII – WAGES AND TAXES

Objective: You will gain an understanding of the methods of payment for workers in
                the food service industry.

Related Information:

        People work for money or wages. Most people who work in a restaurant or other
commercial food establishment will probably be paid according to one or a combination
of the following methods:

        1. Hourly worker – gets paid by the hour.
        2. Salaried worker – gets paid a weekly salary.
        3. Tips – given by the customer to the waiter or waitress.
            Or a combination . . . . .
        4. A waitress may get an hourly wage plus tips.

STATE LAWS:

        Most workers in food service are protected by State wage and hour laws, rather
than Federal laws. These laws set a minimum hourly rate of pay. In New Jersey the
minimum rate is $2.20 per hour, as of 1975.

        The New Jersey wage and hour law also states that employees who work over 40
hours per week are to receive 1½ times their regular hourly wage for the hours in excess
of 40.

        Overtime work is very important to many workers for a number of reasons.

        a. The worker works extra hours and brings home more money.
        b. The worker gets a higher rate of pay for the hours he works overtime.

        For many people who are looking for those little extra luxuries, overtime pay
means an opportunity to earn money over and above the regular wages. You may get
overtime on a regular basis or only when your place of work gets extra busy.

        In addition, according to State Law:

        a. You must get paid at least twice a month.
        b. There should be a regular payday known to all employees.
        c. If you get paid by check you must be able to cash the check without
            difficulty.
        d. No deductions may be taken out of your pay except those authorized
            by the State or Federal government, or where you have authorized your
            employer to take out certain amounts for:

                        Insurance
                        Medical and surgical plans
                        Retirement pension

206

Profit sharing
Savings bonds
Union dues

The employer must also:

Notify all employees at the time of hiring of their rate of pay and when payday is.

Provide each employee with a statement of deductions.

Keep records for employees of wages and hours.

Where waiters and waitresses are concerned (who receive tips), the employer does not have to pay the minimum wage. BUT the meals and/or tips added to the wage must equal at least the minimum wage of $2.20.

THE HOURLY WORKER

The hourly worker gets paid for every hour or part of an hour that he or she works. When you are hired, your boss or foreman will tell you how much you will earn per hour.

Some of you will punch time cards, others will sign in on cards or sheets. In many companies you will lose pay if you are over 3 minutes late.

Forty hours is considered the standard work week, and, as stated above, you must be paid overtime for the hours that you work over 40. That rate is called time and a half.
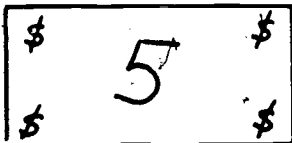
Straight time
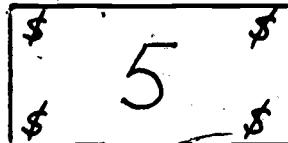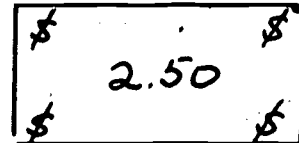
Time-and-a-half
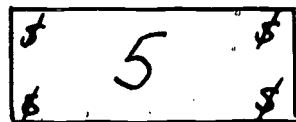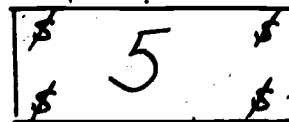
- Double time

If you have to work certain holidays which are not part of your regular schedule, you may be eligible for double-time pay. This is double your regular wage.

You can calculate your overtime pay by any one of three methods.

Method 1.   DIVISION

Hourly rate: $2.00

Divide by 2 to find ½ of the hourly rate.

$$2 \overline{)\,2.00}^{\,1.00}$$

Add the $1.00 to the $2.00:

$1.00
2.00
—————
$3.00   Time-and-a-half rate

Method 2.   FRACTION

Hourly rate: $1.80

$$1½ \times \$1.80 = \frac{3}{2} \times \frac{1.80}{1} = \frac{3}{\underset{1}{\cancel{2}}} \times \frac{\cancel{1.80}^{.90}}{1} =$$

$$\frac{2.70}{1} = \$2.70 \text{ Time-and-a-half rate}$$

Method 3.   PERCENTAGE

Hourly rate: $2.60

$$1½ = 150\% = 1.50$$

Multiply $2.60
             X1.50
             —————
             13000
             260
             ————————
             3.9000   Time-and-a-half rate: $3.90

WEEKLY WAGES

To calculate weekly wages: Multiply the hourly rate by the number of hours
worked.

Hourly rate: $1.75 X 40 hours = $70.00

208

ASSIGNMENT

1. Compute the gross wages for the following workers:

Name	Hourly rate	Hours worked	Gross wages
a. James Jones	$1.90	40	_____
b. Linda Smith	$2.25	40	_____
c. Alan Ricco	$1.85	40	_____
d. John Flint	$2.70	40	_____
e. Diane Nunez	$2.60	38	_____
f. Susan Champino	$2.45	36	_____
g. Fred Mannheim	$3.20	40	_____
h. Fred Belski	$2.15	18	_____
i. Dennis Lovel	$3.60	23	_____
j. Jessie Wilson	$2.90	20	_____

2. Total each person's hours for the week and figure out the gross pay for each one.

		Mon	Tues	Wed	Thurs	Fri	Sat	Total Hours	Rate	Gross
a.	John Jones	8	8	0	8	8	0	_____	$1.75	_____
b.	Tom Holtz	8	7	8	8	8	0	_____	$2.25	_____
c.	Roy Holmes	8	6	5	5	8	2	_____	$2.40	_____
d.	Gary Flynn	7½	8	7	8	8	0	_____	$2.75	_____
e.	Helen Dixon	6½	8	6	0	6	8	_____	$3.35	_____

3. John Nocks worked 45 hours last week. How many hours did he work overtime?   _____

4. Debbie Bass worked 48 hours last week. How many hours did she work overtime?   _____

5. Richard Marino worked 52 hours last week. How many hours did he work overtime?   _____

6. Calculate the overtime hourly rate on the following:

   $1.80 _____ $2.20 _____ $2.75 _____ $3.20 _____ $4.50 _____

7. Calculate the overtime rate and the double time rate:

   $1.84 _____ $1.96 _____ $2.63 _____ $3.15 _____ $3.75 _____

   _____   _____   _____   _____   _____

209

8. Total the hours on the following and separate the pay for the regular hours from the overtime hours:

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Total Hours	Regular Hours	OT Hours
J. Lukacs	8	8	7	8	8	0	0	___	___	___
R. Campos	9	9	9	9	9	0	0	___	___	___
J. Jackson	9	8	9	10	8	8	0	___	___	___
R. Loller	8	7½	9½	9	6	8	0	___	___	___

9. Calculate the regular and overtime wages on the employees in problem 8.

	Rate	Regular	Overtime	Gross Pay
J. Lukacs	$2.40	___	___	___
R. Campos	$2.25	___	___	___
J. Jackson	$2.75	___	___	___
R. Loller	$2.64	___	___	___

10. Jerry Nelson earned $1.75 per hour. Assuming a 40-hour week, how much money did Jerry earn per week after getting a 15¢ hourly raise? ___

11. Jane Franks was earning $1.75 on her part-time job after school. She generally worked 16 hours a week. How much did she earn at $1.75? ___
She was hoping for a $.25 raise in the hourly rate. What would that bring her pay to? ___

12. Kenneth worked 40 hours a week at $2.20 per hour. Calculate his
    weekly earnings ___
    monthly earnings (assume 4 weeks) ___
    yearly earnings (52 weeks) ___

13. Calculate the gross pay on the following:

D. North   45 hours $3.75   ___

T. Sullivan   48 hours $2.80   ___

210

R. Keith   44 hours $4.50   _____

D. Ernst   43½ hours $3.50   _____

R. Fischer   39 hours $3.12   _____

F. Lombardi   46 hours $2.70   _____

S. Rodriguez   40 hours reg $2.40   _____
                8 at double time

T. Houston   48 hours plus $3.65   _____
                4 hours' double time

Lesson 2   Pay Day

Objective: You will learn how to read your pay check and record stub.

Related Information:

When most employees get paid, they receive a long form or stub which contains a record of their pay and their deductions, along with their pay. It is necessary to read and understand your pay stub to make certain your boss has paid you the correct amount of money.

What the words mean on the stub:

Gross pay: The total amount of money you have earned.

$$40 \text{ hours} \times \$2.50 = \$100.00$$

Net pay: What you actually get to take home and spend.

Gross pay — Deductions = Net pay
$100.00 — $29.20   = $70.80

Deductions: All the amount taken out (deducted or subtracted) from your pay. Some deductions are by law, like income taxes. Some require your approval, like savings bonds.

FICA, or Social security: (See the chapter on Social Security for further details.) Basically for your retirement.

Income tax: Money taken out of your pay for supporting the Federal government and all its programs.

Unemployment insurance: State insurance to pay you a weekly amount if you lose your job.

Blue Cross and Blue Shield, or other medical insurance: Hospital payments, surgical payments, and possibly other medical payments for you and your family if you are ill. You may pay it all, your boss may pay part, or he may pay all.

Pension: A company plan for retirement. Many of the larger companies have pension plans. You may contribute to the payments.

Union dues: Sometimes taken out of your pay; sometimes you pay the dues yourself.

Savings bond: A form of savings. You decide how much you want taken out of your pay and put into government bonds.

Some items above are taken out each week. Medical insurance may be taken out of your pay only once a month. Some companies pay each week, some pay every other week, and some pay twice a month.

212

DEDUCTIONS YOU PAY:

HOSPITAL-MEDICAL (All or part or none)

INCOME TAX (All)

UNEMPLOY-MENT INSURANCE (Part)

PENSION (All or part or none)

SOCIAL SECURITY (Half)

UNION DUES (All)

HOSPITAL-MEDICAL (All or part or none)

UNEMPLOY-MENT INSURANCE (Part)

SOCIAL SECURITY (Half)

PENSION (All or part or none)

BOSS PAYS:

TAXES ON THE BUSINESS (All)

213
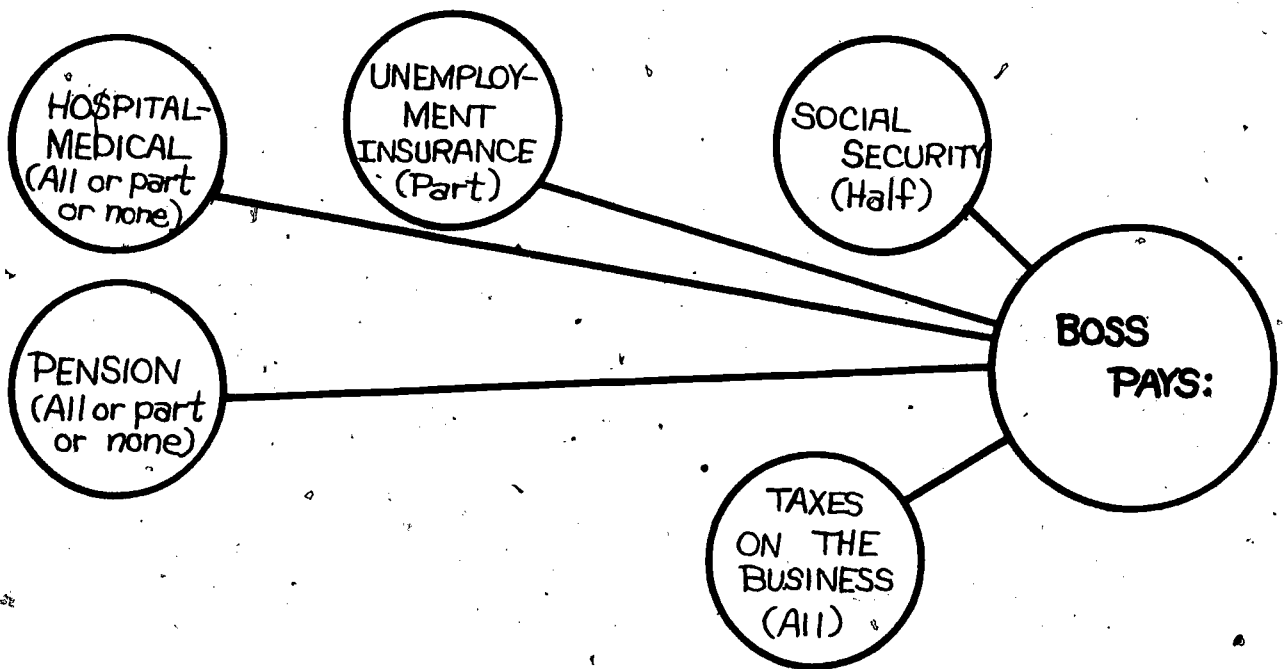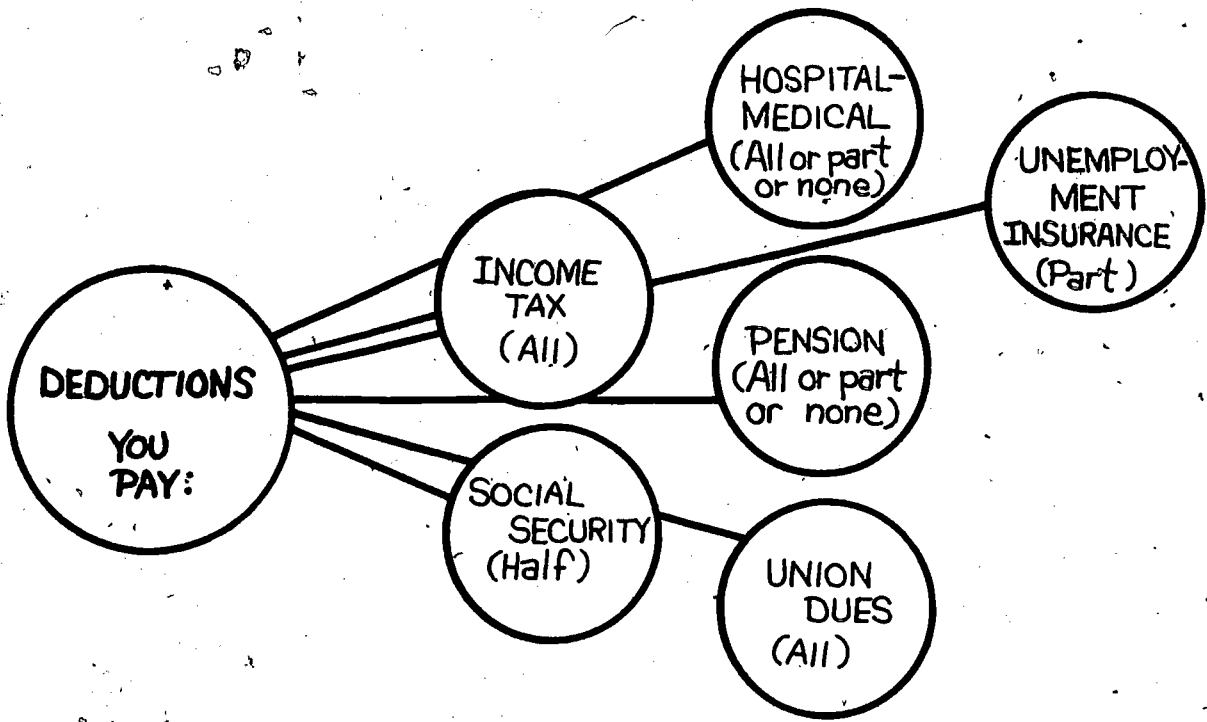
Objectives: You will learn the importance of tips in the earnings of the waiter or waitress.

You will learn how tips are computed.

Related Information:

In a previous unit, you learned how wages are computed and the importance of overtime. The waiter or waitress does not receive the minimum wage from the employer. The government, in setting up the minimum-wage laws to protect workers, took into account the fact that in some occupations workers earn considerable money through tips from customers. The government allows the employers in the restaurant business to pay less than the usual minimum wage for workers.

The minimum wage is determined by allowing for tips and for meals. The wage must be set so that the waiter or waitress must earn at least the statewide minimum wage when meal costs plus tips earned are added to the amount the employer pays. If the waiter or waitress does not earn at least the minimum wage altogether, the employer must raise his or her pay.

Good waiters and waitresses are worth much more than the minimum, and their tips can be considerable.

HOW TIPS ARE CALCULATED

There are no fixed amounts to tip a waiter or waitress. Most restaurant-goers follow an accepted standard. At present the standard is somewhere between 15% and 20% of the cost of the meal.

A good tip is recognition of good service and *must be earned*. If the customer were eating at home and wanted more bread, say, or butter, or a clean spoon, he or she could get up and get it. In a restaurant, the customer is completely dependent on the waiter or waitress. It is most annoying not to have your needs met. A good waitress knows when to bring more water, or catsup. She keeps an eye on the table and makes certain her customers' needs are met promptly.

The cost of the meal and the length of time you and your party occupy the table are also important factors. If you wish to talk after a meal, remember that you may be tying up the table and preventing the waitress from serving additional customers. You should make up for this in the size of the tip.

Take the total of the bill (less the tax)

Example:	$8.40	
20% of $8.40	X	.20
	$1.6800	

You could leave $1.50, $1.60, $1.70, $1.75, or more.

The amount you actually leave may depend upon the change left when you pay your bill.

ASSIGNMENT:

1. Compute a 15% tip on the following bills:

    a. $4.50   _____

    b. $7.35   _____

    c. $6.90   _____

    d. $12.90   _____

    e. $9.20   _____

2. Compute a 20% tip on the following bills:

    a. $8.10   _____

    b. $15.50   _____

    c. $13.60   _____

    d. $18.85   _____
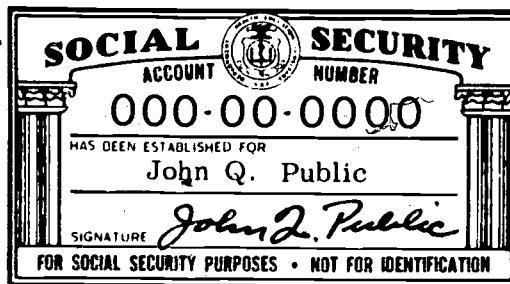
    e. $24.65   _____

215

Introduction:

Taxes play an important role in everyone's life. You will pay taxes as a worker, and if you own your own business you will have to pay taxes on your profits.

Before you can make out your own income tax, you must learn about a number of things — social security, income tax forms, how tips are reported, etc. In this and the next two lessons we will talk about these things.

Objective: You will learn how the social security program affects you.
                      You will learn how to compute your FICA deduction.

Related Information:

An employer (the boss) is required to make certain deductions from an employee's wages. These include deductions for income taxes, social security taxes, unemployment insurance, and any other deductions authorized by the employee.

```
┌─────────────────────────────────────────────────┐
│  SOCIAL  🏛️  SECURITY                           │
│     ACCOUNT        NUMBER                         │
│     000·00·0000                                   │
│  HAS BEEN ESTABLISHED FOR                         │
│     John Q. Public                                │
│  SIGNATURE  John Q. Public                        │
│  FOR SOCIAL SECURITY PURPOSES · NOT FOR IDENTIFICATION │
└─────────────────────────────────────────────────┘
```

```
ID            CN              DO.                    ┌─ DO NOT WRITE IN THE ABOVE SPACE ─┐
APPLICATION FOR A SOCIAL SECURITY NUMBER
See Instructions on Back.        Print in Black or Dark Blue Ink or Use Typewriter.

1  Print FULL NAME,        (First Name)    (Middle Name or Initial — if none, draw line ___)   (Last Name)
   YOU WILL USE IN WORK
   OR BUSINESS

2  Print FULL                                                              6  YOUR   (Month)  (Day)  (Year)
   NAME GIVEN                                                                 DATE OF
   YOU AT BIRTH                                                               BIRTH

3  PLACE      (City)           (County if known)          (State)          7  YOUR PRESENT AGE
   OF                                                                         (Age on last birthday)
   BIRTH

4  MOTHER'S FULL NAME AT HER BIRTH (Her maiden name)                       8  YOUR SEX
                                                                              MALE   FEMALE
                                                                              □      □
5  FATHER'S FULL NAME (Regardless of whether living or dead)               9  YOUR COLOR OR RACE
                                                                              WHITE  NEGRO  OTHER
                                                                              □      □      □
10 HAVE YOU EVER BEFORE APPLIED FOR          DON'T   (If "YES" Print STATE in which you applied and DATE you applied and SOCIAL SECURITY NUMBER (if known)
   OR HAD A UNITED STATES SOCIAL      NO  KNOW  YES
   SECURITY, RAILROAD, OR TAX ACCOUNT  □   □    □
   NUMBER?

11 YOUR        (Number and Street, Apt. No., P O Box, or Rural Route)      (City)        (State)        (Zip Code)
   MAILING
   ADDRESS

12 TODAY'S DATE         NOTICE: Whoever, with intent to falsify his or someone else's true identity, willfully furnishes or causes to be
                        furnished false information in applying for a social security number, is subject to a fine of not more than $1,000
                   14   or imprisonment for up to 1 year, or both.

13 TELEPHONE NUMBER     Sign YOUR NAME HERE (Do Not Print)

FORM SS-5 (5-74)           □ RESCREEN   □ ASSIGN   □ DUP ISSUED    Return completed application to nearest
                                                                   SOCIAL SECURITY ADMINISTRATION OFFICE
```

Remember: *Gross pay* is everything you earn. *Deductions* are subtracted from your pay, and you take home what is left – called *net pay*. Before 1940, workers had only what little they could save for their old age, or in case of illness, or for their families in case of their death. Out of the Depression and a change in attitude as to the responsibility of government, the Congress passed the Federal Insurance Contribution. Act, which is known officially as **FICA** (the abbreviation), or as we all know it, the Social Security Act. Payments to the social security fund were first collected back in 1937; changes in the law have been made many times and are still madd from time to time by Congress.

Computing social security is basically a percent problem. The Government takes a certain *percent* of your weekly earnings. Your employer collects this (and also matches the amount out of his own business receipts). The *rate* remains the same for any particular year, but as your weekly earnings go higher, the *amount deducted* will go higher.

There is a limit on how much you can get from the social security fund when you retire. The program was not designed to make you rich. There is therefore a limit on how much a person has to pay in to the fund each year. If this amount is reached in any year, your boss will stop taking out FICA.

HOW TO COMPUTE YOUR OWN SOCIAL SECURITY TAX

A person earns $86.00 a week (gross). How much will be deducted from his salary for social security tax? The rate as of 1975 was 5.85% of wages (up to $14,100 a year). So at this rate,

$$5.85\% \text{ of } \$86.00 = .0585 \times \$86.00$$

Answer $5.03

Rework this problem using the rate in effect now.

Answer:

ASSIGNMENT A:

Find the amount of the social security tax on each of the following wages at the current tax rate.

1. $86.70   _____

2. $93.95   _____

3. $97.60   _____

4. $104.40   _____

5. $126.30   _____

217

FROM SOCIAL SECURITY NUMBER
TO
SOCIAL SECURITY BENEFITS

SOCIAL SECURITY ADMINISTRATION

ESTABLISHES AN EARNINGS
RECORD FOR YOU

RECORDS YOUR EARNINGS

COMPUTES THE AMOUNT
OF YOUR BENEFIT;
AUTHORIZES TREASURY TO
MAKE PAYMENT

TREASURY SENDS CHECKS

ARRANGES FOR PAYMENT OF
HOSPITAL AND MEDICAL BILLS

AUTHORIZES TREASURY TO
MAKE PAYMENT
TREASURY SENDS CHECKS

BEFORE YOU START WORKING
You Get a Social Security Number

WHILE YOU WORK
Your Employers Withhold Social Security Contributions—REPORT YOUR EARNINGS
Self-employed People Pay Their Own Contributions
and Report Their Own Earnings

AT RETIREMENT,
IN CASE OF DISABILITY
You File a Claim for Benefits

YOU, YOUR DEPENDENTS
RECEIVE MONTHLY BENEFITS

AT 65
You Become Eligible for Health Insurance

AT YOUR DEATH
Your Survivors Claim Benefits
Your Survivors Receive Benefits

218

6. $135.60

7. $146.75

8. $236.00

HOW TO COMPUTE THE SOCIAL SECURITY TAX THROUGH USE OF A TABLE

The Federal Government supplies employers with tables for determining the FICA tax that is to be withheld. Using these tables rather than computing the tax as described above saves many hours of labor. Your instructor will explain how to use the tables. Now check the problems given to you in the previous assignment by using the tables. Do you think you will get the exact amount? Why or why not?

It is a good idea to check your own social security record from time to time to make sure that your earnings have been reported correctly. This is especially true if you change your job frequently. You can check your record by sending in a postcard that you can get from your local social security office.

SELF EMPLOYED

When you work for someone else, you pay half the full social security rate and your boss pays the other half. But if you are your own boss, instead of paying double for yourself, the government allows the self-employed person (boss) to pay only 1½ times.

WHAT ARE YOUR BENEFITS?

We have spent most of the time so far discussing how much we pay, but what do we get out of this?

1. When you retire, you will collect monthly social security payments.

2. If you become disabled and cannot work, you will collect monthly payments.

3. If you should die before you retire, your dependents would get social security payments.

4. 80% of your hospital bills will be paid through medicare (after you pay a fixed amount, called the deductible) as soon as you reach 65.

5. You will be able to collect on your doctor bills also, if you sign up and pay a small amount each month — also from age 65 on.

6. And if that doesn't work, your family will receive burial expenses for you.

HOW TO GET YOUR BENEFITS

To get social security payments for yourself and your family, you must first have *credit for a certain amount of work under social security. If you want to take out, you must have paid in to the fund.*

Social security credits are called "quarters of coverage." The year is divided into four parts (calendar quarters).

You can get social security credit for up to four quarters in a year. For an employee, a quarter of coverage means any calendar quarter in which he or she is paid at least $50.00.

If you work for yourself, you get four quarters of coverage for each year in which you have a net profit of at least $400.

If you are a teenager now, you will need at least 40 quarters of coverage at some time in your working career in order to be eligible for benefits upon retiring. (The requirement is different for those who get benefits because they are disabled; they need credit for 5 years of work in the 10 years just before becoming disabled.)

A worker who has met the employment requirements of the law may retire at age 65 or older and receive monthly retirement payments for the rest of his life. The amount he is entitled to at 65 is called his *primary benefit,* and it is based upon the average of his earnings during most of his working career.

Any worker may retire as soon as he or she reaches age 62, if he or she wishes. If he does, his monthly payments will be 80% of the primary benefit. For each month he waits after 62, his monthly payments go up.

Benefits are paid not only to a person who retires, but to his wife (or a dependent husband) when that person reaches 65 (or 62, at a smaller amount), and to any young or physically dependent children he may have. When a worker dies, whether or not he or she has retired, the widow (or dependent widower) collects payments as soon as he or she reaches 62 (or 60 for a widow, at a smaller amount). Even dependent parents, 62 or over, can collect benefits. If a worker dies leaving dependent children, his wife receives benefits (as well as the children) regardless of her age.

The social security fund also pays a lump sum upon the death of a worker, for funeral expenses.

2 29

A FEW POINTS TO KEEP IN MIND ABOUT SOCIAL SECURITY

1. Payments never come automatically. *Someone has to apply for them.* It may be the worker upon retirement or if disabled, or it may be a widow or dependent widower if the spouse dies. This person should contact the nearest social security office.

2. A person might be entitled to benefit payments on two accounts (for example. a widow who is eligible to collect on her own social security as well as on her late husband's). In such a case, only the larger of the two benefits will be paid:

3. A person who is collecting social security benefits may earn up to a certain amount (in 1975, it was $2520 a year) without having his social security payments reduced. If he is 72 or older, however, he may earn any amount without a penalty.

ASSIGNMENT B:

1. Name five deductions your boss might take out of your pay. _____
_____

2. Which deductions *must* he take out of your pay? _____
_____

3. Which do you take home, gross pay or net pay? _____

4. FICA is an abbreviation for: _____

5. What percent (rate) of your gross pay is taken out for FICA? _____

6. FICA is not deducted from gross earnings above _____

7. If you earned $125.00 last week, how much FICA would the boss have taken out of your pay? _____

8. Social Security deductions started in 1937 and the rate has always been the same. __True __False.

9. You can get a social security card from the _____

10. You may have more than one social security number. __Yes __ No.

11. If you lose your social security card you must apply for a new number. __ True __ False

12. Name five types of benefit payments from social security. _____
_____

13. What is a quarter of coverage? _____
_____

14. How many quarters of coverage will a teenager have to work to be eligible for FICA when he or she retires? _____

221

15. At what age can a worker retire and collect full benefits? _____

16. At what age can a worker retire and collect reduced benefits? _____

17. How do you get benefits from social security? _____

18. Can you work and still collect social security benefits? _____

222

This man collects Social Security.

You don't have to be retirement age to get social security. Take a young man like this.

What happens to him if his father dies prematurely? How does his mother raise him?

Savings and insurance? Many families have them.

But nearly every family has social security. And this year, social security is helping over three million children and their widowed mothers.

A young widow with two children, whose husband earned $100 a week on the average, for example, receives $348.80 a month in survivors benefits.

And full-time students who are survivors or children of disabled or retired workers may collect benefits until they reach 22. Social security benefits now being paid to those students amount to more than the scholarships at all colleges and universities in the country.

If you think social security helps when you retire, you're right. But it's also something you can depend on now. For further information, contact any social security office.
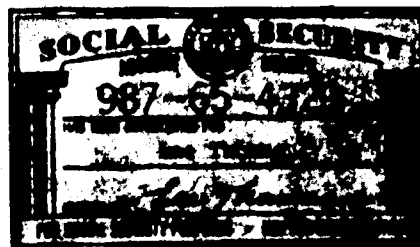
Social security pays four benefits: survivors, disability, retirement, and Medicare.

223

ASSIGNMENT C:

You will compute the net pay for six different workers, using the paycheck stub given after each problem.

1. Compute overtime pay at time and one-half.

2. Use "Gross Wages" as the basis for all deductions.

3. Look up the deduction for the Federal income tax on the chart on page 227.

4. Calculate the FICA tax at your current rate of tax.

5. Assume an unemployment-insurance tax of 1%.

6. Any other deduction should be named, with the amount, under "Other."

1. Brenda worked 40 hours last week at $2.50 an hour. In addition to the usual deductions, $1.50 was taken out for Blue Cross. Find her net pay.

Total hours	Reg. hours	O.T. hours	Reg. Pay	O.T. Pay	Gross Wages	Federal Income Tax	F.I.C.A.	U/I	Other

Net Pay: _____

2. Wayne worked 40 hours last week at $2.20 an hour.

Total hours	Reg. hours	O.T. hours	Reg. Pay	O.T. Pay	Gross Wages	Federal Income Tax	F.I.C.A.	U/I	Other

Net Pay: _____

233

3. Sally worked 48 hours at $3.40 an hour.

Total hours	Reg. hours	O.T. hours	Reg. Pay	O.T. Pay	Gross Wages	Federal Income Tax	F.I.C.A.	U/I	Other

Net Pay: _____

4. Brian worked 45 hours at $3.75 an hour.

Total hours	Reg. hours	O.T. hours	Reg. Pay	O.T. Pay	Gross Wages	Federal Income Tax	F.I.C.A.	U/I	Other

Net Pay: _____

234

5. Jean worked 45 hours at $4.75 an hour. She had extra deductions for union dues, $2.00, and for a savings bond, $6.25.

Total hours	Reg. hours	O.T. hours	Reg. Pay	O.T. Pay	Gross Wages	Federal Income Tax	F.I.C.A.	U/I	Other

Net Pay: _____

6. Phil worked 48 hours at $3.80 an hour.

Total hours	Reg. hours	O.T. hours	Reg. Pay	O.T. Pay	Gross Wages	Federal Income Tax	F.I.C.A.	U/I	Other

Net Pay: _____

226

And the wages are—		Number of withholding exemptions claimed is—	
At least	But less than	0	1
		The amount of income tax to be withheld shall be	
$0	$11		$0
11	12		0
12	13		0
13	14		0
14	15		0
15	16		0
16	17		0
17	18		0
18	19		0
19	20		0
20	21		0
21	22		0
22	23		0
23	24		0
24	25		0
25	26		.10
26	27		.20
27	28		.40
28	29		.50
29	30		.60
30	31		.80
31	32		.90
32	33		1.10
33	34		1.20
34	35		1.30
35	36		1.50
36	37		1.60
37	38		1.80
38	39		1.90
39	40		2.00
40	41		2.20
41	42		2.30
42	43		2.50
43	44		2.60
44	45		2.70
45	46		2.90
46	47		3.00
47	48		3.20
48	49		3.30
49	50		3.40
50	51		3.60
51	52		3.80
52	53		4.00
53	54		4.20
54	55		4.30
55	56		4.50
56	57		4.70
57	58		4.90
58	59		5.10
59	60		5.20
60	62		5.50
62	64		5.90
64	66		6.20
66	68		6.60
68	70		7.00
70	72		7.30
72	74		7.70
74	76		8.00
76	78		8.40
78	80		8.80

And the wages are—		0	1
At least	But less than		
$80	$82		$9.10
82	84		9.50
84	86		9.80
86	88		10.20
88	90		10.60
90	92		11.00
92	94		11.40
94	96		11.90
96	98		12.30
98	100		12.70
100	105		13.40
105	110		14.50
110	115		15.50
115	120		16.60
120	125		17.60
125	130		18.70
130	135		19.70
135	140		20.80
140	145		21.80
145	150		22.90
150	160		24.50
160	170		26.60
170	180		28.70
180	190		30.80
190	200		32.90
200	210		35.00
210	220		37.10
220	230		39.30
230	240		41.60
240	250		43.90
250	260		46.60
260	270		49.30
270	280		52.00
280	290		54.80
290	300		57.90

227

Objective: You will learn some of the terms and forms used in figuring out income
                tax.

Related Information:

        First of all, you should understand how the income-tax system works. Each week
your boss witholds (deducts) a certain amount of income tax from your pay. The total
withheld for the year will not be the *exact* amount you are required to pay for the year,
but it should be very close. Before April 15 of the following year, you have to send the
Internal Revenue Service (tax collector) a form that tells the *exact amount of your tax*
for the year. If you have paid more than this amount in withholding taxes, the IRS will
send you a *refund;* but if the deductions from your pay did not come to this amount,
then you must send the *balance* to the IRS along with the form.

        If by some chance you owe no tax at all but your boss withheld some of your
pay for income taxes, then you should file a tax return to get a refund.

        Each year the Federal government makes available to all schools information on
how to fill out an income tax form. Changes take place from year to year, but certain
basics remain the same. We will discuss the basics in this unit, leaving it up to your
instructor to fill you in on the latest changes.

        Every resident of the United States who had an income last year of $2050 if
single (as of 1975) must report the amount of his or her income to the Internal Revenue
Service. Married couples must report if their income was $2800 or more.

YOU MUST FILE A TAX FORM:

        a.   If you earned over the required amount ($2050 in 1975, if you were single).

        b.   If you earned less than the required amount but taxes were deducted from
             your pay. You will then get a refund.

        c.   If you received tips on which FICA was not taken out, regardless of the
             amount you earned.

        d.   If you earned $400 or more in your own business.

        e.   If you had gross income of $750 or more, had unearned income (such as
             interest payments), and can be claimed as a dependent by another taxpayer.

THE W-4 and W-4E FORMS

        Your employer (boss) must know how much to take out of your pay for income
tax. When you start a job, your employer has you fill out a W-4 form. It is called the
Employee's Withholding Allowance Certificate.

228

When you fill out the W-4 form, you indicate how many *allowances* (also called exemptions) you have. An allowance is a *person who depends on you for money.*

Allowances: Your wife
Your children
Parents
Yourself

You can claim an allowance for someone who is dependent on you for money to live on. If your wife works and she claims herself, then you cannot claim her. If your children are over a certain age and working, you cannot claim them. If you are not providing aid for your parents, you cannot claim them.

You are taxed on the amount of money you earn, but the more allowances (dependents) you have, the less tax you pay. You are permitted to claim fewer allowances than you are entitled to (and more taxes will be deducted from your pay), but you cannot claim more.

Your W-4 form is kept in your employer's office. If the number of your allowances changes, you must ask to fill out a new form.

Changes may occur when: You get married,
You have children,
You help your parents.

HOW TO FILL OUT THE W-4 FORM (see page 230).

1. Print your full name.
2. Enter your social security number.
3. Enter your home address.
4. Enter city, state, and zip code.
5. Choose the allowances that fit your case (on upper portion of form).
6. Add up your allowances and enter the number on the form.
7. Date and sign the certificate.

THE W-4E FORM

Form **W-4E** Department of the Treasury Internal Revenue Service	**Exemption From Withholding** (of Federal Income Tax) For use by employees who incurred no tax liability in 1974 and anticipate no tax liability for 1975	**1975**
Type or print full name		Social Security Number	Expiration date (see instructions and enter date)

Home address (Number and Street)

City, State, and ZIP Code

Employee.—File this certificate with your employer. Otherwise he must withhold Federal Income tax from your wages.	**Employee's certification.**—Under penalties of perjury, I certify that I incurred no liability for Federal income tax for 1974 and that I anticipate that I will incur no liability for Federal income tax for 1975.
Employer.—Keep this certificate with your records. This certificate may be used instead of Form W-4 by those employees qualified to claim the exemption.	_____ (Signature) _____ (Date)

229

Employee's Withholding Allowance Certificate

The explanatory material below will help you determine your correct number of withholding allowances, and will indicate whether you should complete the new Form W-4 at the bottom of this page.

How Many Withholding Allowances May You Claim?

Please use the schedule below to determine the number of allowances you may claim for tax withholding purposes. In determining the number, keep in mind these points: If you are single and hold more than one job, you may not claim the same allowances with more than one employer at the same time; If you are married and both you and your wife or husband are employed, you may not claim the same allowances with your employers at the same time. A nonresident alien other than a resident of Canada, Mexico or Puerto Rico may claim only one personal allowance.

Figure Your Total Withholding Allowances Below

(a) Allowance for yourself—enter 1 .... _____

(b) Allowance for your wife (husband)—enter 1 . ... _____

(c) Allowance for your age—if 65 or over—enter 1 . ..... _____

(d) Allowance for your wife's (husband's) age—if 65 or over—enter 1 . ... _____

(e) Allowance for blindness (yourself)—enter 1 . ... _____

(f) Allowance for blindness (wife or husband)—enter 1 . .. _____

(g) Allowance(s) for dependent(s)—you are entitled to claim an allowance for each dependent you will be able to claim on your Federal income tax return. Do not include yourself or your wife (husband)* ...... _____

(h) Special withholding allowance—If you have only one job, and do not have a wife or husband who works— enter 1 .... _____

(i) Total—add lines (a) through (h) above .... _____

If you do not plan to itemize deductions on your income tax return, enter the number shown on line (i) on line 1, Form W-4 below. Skip lines (j) and (k).

(j) Allowance(s) for itemized deductions—If you do plan to itemize deductions on your income tax return, enter the number from line 5 of worksheet on back . ... _____

(k) Total—add lines (i) and (j) above. Enter here and on line 1, Form W-4 below . ... _____

*If you are in doubt as to whom you may claim as a dependent, see the instructions which came with your last Federal income tax return or call your local Internal Revenue Service office.

See Table and Worksheet on Back if You Plan to Itemize Your Deductions

Completing New Form W-4

If you find that you are entitled to one or more allowances in addition to those which you are now claiming, please increase your number of allowances by completing the form below and filing with your employer. If the number of allowances you previously claimed decreases, you must file a new Form W-4 within 10 days. (Should you expect to owe more tax than will be withheld, you may use the same form to increase your withholding by claiming fewer or "0" allowances on line 1 or by asking for additional withholding on line 2 or both.)

▼ Give the bottom part of this form to your employer; keep the upper part for your records and information ▼

Form W-4
(Rev. Aug. 1972)
Department of the Treasury
Internal Revenue Service

Employee's Withholding Allowance Certificate

(This certificate is for income tax withholding purposes only; it will remain in effect until you change it.)

Type or print your full name | Your social security number

Home address (Number and street or rural route) | Marital status
□ Single   □ Married

City or town, State and ZIP code | (If married but legally separated, or wife (husband) is a nonresident alien, check the single block.)

1 Total number of allowances you are claiming .... _____

2 Additional amount, if any, you want deducted from each pay (if your employer agrees) .... $ _____

I certify that to the best of my knowledge and belief, the number of withholding allowances claimed on this certificate does not exceed the number to which I am entitled.

Signature ▶ _____ Date ▶ _____ 19_____

If you did not earn enough money last year to pay taxes, and you don't expect to earn enough this year to pay taxes, you may ask to fill out the W-4E Form instead of the W-4. No taxes will be taken out of your pay if you fill out this form.

When you get a new job, you indicate the number of allowances by filling out the W-4 or W-4E form. You also give your boss your social security number so he can take out FICA for you. If you are in a job where you receive tips, you have something else to consider.

TIPS

The tips you receive are yours, but you must report them in order for your boss to take out the proper amount of social security and income tax from your pay. You do not have to pay income tax on your tips if they amount to less than $20 a month. The social security tax, however, must be paid on any amount you earn in tips up to the maximum amount indicated for the year.

In most places you will be expected to report your tips for the month by the 10th of the next month, in order for your boss to make the proper deductions for taxes and FICA. Other methods have been worked out, however, and you should check your tax guide for information on these.

To help you report your tips, the government provides a little booklet. This booklet contains forms 4070 and 4070A.

Form 4070A (see page 233) provides you with places to record the tips you take in each day of the month.

Form 4070 is used to report to your employer the total amount of your tips for the month.

YOU fill out form 4070A; it is used each day.

YOU fill out form 4070 once a month by taking the month's total from form 4070A.

Examples:

1. You work for Watson's Restaurant during the month and receive $75 in tips. Since your tips exceed $20 for the month, the entire $75 must be reported to your employer. He will deduct income tax and social security tax for the tips from your wages.

2. Your work for Watson's Restaurant during the month and receive $17 in tips. In that same month you work for Parkview Restaurant and get $14 in tips. Even though your tips amount to a total of $31, you are not required to report them to either employer, since you had less than $20 in tips in each job.

3. If you received $22 in tips from Watson's Restaurant and $14 in tips from Parkview Restaurant, you must report the $22 to Watson's Restaurant. You are not required to report the $14 to Parkview Restaurant.

4. If you received $22 in tips from Watson's Restaurant and $32 in tips from Parkview Restaurant, you must report both the $22 to Watson's Restaurant and the $32 to Parkview Restaurant.

Tip splitting: Only those tips *you* receive on your own behalf are counted. Where employees split tips (for example, where waiters give a portion of their tips to the busboys), each employee reports only his share to his employer.

Remember: You will have to pay a social security tax on *all* your tips (even though you do not pay income tax on tips of less than $20 for the month). This is to your advantage, because your social security benefits someday will be based on your *total* earnings, not just your taxable earnings. (See page 239)

Your employer does not have to match your social security payments on any of your tip income. He pays the FICA tax on only the wages that *he* pays you.

ASSIGNMENT: You earned the following tips for the month of January. Fill out form 4070A and form 4070.

January	1. closed		January	17. off
January	2. $7.50		January	18. $4.20
January	3. off		January	19. $4.50
January	4. $5.20		January	20. $6.00
January	5. $6.25		January	21. $6.90
January	6. $7.10		January	22. $5.10
January	7. $6.30		January	23. $9.30
January	8. $6.95		January	24. off
January	9. $8.00		January	25. $5.80
January	10. off		January	26. $6.25
January	11. $5.80		January	27. $5.95
January	12. $6.20		January	28. $9.05
January	13. $4.30		January	29. $7.25
January	14. $5.35		January	30. $7.90
January	15. $8.65		January	31. off
January	16. $9.25			

241

THIS IS YOUR TIP BOOKLET. Under the front cover are your instructions.

Form 4070A, shown below, is your daily record of tips.

EMPLOYEE'S DAILY RECORD OF TIPS (FORM 4070A) AND REPORT OF TIPS TO EMPLOYER (FORM 4070)

NAME AND ADDRESS OF EMPLOYEE

U.S. Treasury Department
Internal Revenue Service

DOCUMENT 5635
(Jan. 1966)

DAILY RECORD OF TIPS

EMPLOYER'S NAME

MONTH			YEAR	

Date	Tips	Date	Tips
1	$	17	$
2		18	
3		19	
4		20	
5		21	
6		22	
7		23	
8		24	
9		25	
10		26	
11		27	
12		28	
13		29	
14		30	
15		31	
16		Total $	

Form 4070A (1–66)

Form 4070, shown below, is filled out by you and turned in to your boss each month.

Form 4070 (Jan. 1966) U.S. Treasury Department Internal Revenue Service	EMPLOYEE'S REPORT ON TIPS	Social Security Number

Employee's name and address

Employer's name and address

Month or shorter period in which tips were received	Amount
from ...., 19........, to ...., 19........	$...
Signature	Date

242

Lesson 6   The Tax Form

Objective: You will learn what information has to be included on your tax form.

Related Information:

After the end of the year, each employer (boss) sends each employee (worker) two copies of the W-2 form, called the Wage and Tax Statement.

This is what it looks like:

Wage and Tax Statement 1974

Type or print EMPLOYER'S Federal identifying number, name, address, and ZIP code above.

Copy B To be filed with employee's **FEDERAL** tax return

FEDERAL INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION			
1 Federal income tax withheld	2 Wages, tips, and other compensation		3 FICA employee tax withheld	4 Total FICA wages	5 Uncollected employee FICA tax on tips	

EMPLOYEE'S social security number ▶	OTHER INFORMATION

Was employee covered by a qualified pension plan, etc.? Yes ☐ No ☐	Contribution to individual employee retirement account	Cost of group term life insurance included in box 2	Excludable sick pay included in box 2

This information is being furnished to the Internal Revenue Service and appropriate State officials.

Type or print EMPLOYEE'S name, address, and ZIP code above.

An "X" in the upper left corner indicates this is a corrected form.

Form **W—2**   Department of the Treasury—Internal Revenue Service

You cannot fill out your tax form until you get your copy of this W-2 form.

It contains:

1. The amount of money withheld by the employer for your income tax. (You must know this to see whether you owe the government money or it owes you money.)

2. Your total earnings for the year. (You must know this to calculate your taxes.)

3. FICA (Social Security). How much you paid out for social security.

4. Any amount of reported tips that the employer did not deduct taxes for. (You will have to pay the taxes yourself.)

You will receive a W-2 form from each employer you worked for last year. You have to add them together to get the complete picture of your total earnings.

234

You must attach a copy of your W-2 form(s) to your income-tax form.

You keep one copy of each W-2 form for your own records.

Actually, four copies are made of each W-2 form:

> Your boss sends one to the Internal Revenue Service.
> Your boss keeps one.
> Your boss sends two to you. Then you send one to the IRS and you keep one for your own records.

Your instructor will get copies of the latest income-tax form from the Internal Revenue Service, and the class will go over the form together.

PERSONAL EXEMPTIONS OR ALLOWANCES

Exemptions were discussed when we looked at the W-4 form.

In 1975 you were allowed a $750 deduction for each exemption (allowance) you claimed, including yourself. This amount changes from time to time.

DEDUCTIONS

There are different methods of claiming *deductions*. The more deductions you have, the less tax you will have to pay.

1. You do not have to pay any tax at all until you earn $2050 (as of 1975). This gives you a *minimum standard deduction.*

2. As your earnings go higher, you are entitled to use the *normal standard deduction* (15% of income as of 1975). Instead of listing each deductible item, you simply claim 15% of your income and save yourself a lot of work.

3. If you have deductible expenses that amount to over 15% of your income, you must list them separately ("itemize" them) in order to claim them.

4. Itemized (listed) deductions

> Under this heading you can claim certain amounts contributed to:
> > charities
> > religious affiliation
> > first aid and fire squads
> > Boy Scouts, Girl Scouts
> > Red Cross
> > United Fund
> > Cancer fund, Heart fund, other health agencies

> Half of the cost of medical insurance that you paid is deductible.

> Doctor and other medical and dental bills may be claimed, but only the part that is over 3% of your income.

> Union dues are deductible.

235

Expenses for care of the children of working parents are deductible.

Restaurant workers can claim money for uniforms and shoes which can only be used on the job.

There are many other deductions also — taxes paid, interest paid, etc.

Many people pay these bills by check so they have a record at income tax time. The IRS can call you in at any time and question your deductions. You must have proof that you actually paid for these things.

The IRS includes instructions when it sends you your form. If you have problems that the instructions don't cover, you can consult one of the many publications issued by the government or private companies on filling out your income tax form. You can look up questions on: exemptions, deductions, uniforms, and many, many more. The Federal Government publishes "Your Federal Income Tax." It is available at no cost at most IRS offices.

In addition, your local office of the IRS will help you fill out your tax form at no charge. Or if you have just a question or two, there are toll-free numbers to call in all areas of the country.

If you lose your form, you can call your employer and he can make up a duplicate.

In filling out your income tax, you need the picture for the whole year. If you should get a new dependent (a baby) the last week of the year, you would get credit for an exemption for the whole year. This would almost certainly result in your getting a refund from the IRS.

As mentioned before, the government has made it possible for people earning less than $2050 a year (as of 1975) to fill out a W-4 E form. If they earned less than that the previous year and expect to earn less than that this year, they can fill out this special form and the boss will not withhold any taxes.

If you worked for more than one employer, they may each have taken out the proper amount of FICA, but together the deductions may have been over the maximum limit. You will then be entitled to a refund of the overpayment when you file your income-tax form.

Those who work for themselves, like a restaurant owner, must estimate (figure out as accurately as possible) their earnings for the year ahead and then pay one-quarter of this amount every 3 months. Then they "settle up" with the IRS by April 15 of the next year, just like wage-earners.

Wage- and salary-earners must also report extra income, such as *interest* from savings accounts or bonds, and *dividends* from stocks. You know that you must also include income from tips. Any other sources of income must also be reported — even winnings from a lottery or gambling.

245

ASSIGNMENT:

1. If you (a single person) earned over _____ last year, your must pay income taxes.

2. If you earned $500. last year, would you have to file an income tax return?_____

3. Do you have to report tips and pay on them? _____

4. Do you have to file a statement if your parents are filing? _____

5. How does your boss know how much to take out of your pay for tax?_____

_____

6. Who are some tax allowances?_____

7. What is the difference between a W-4 and W-4E form?_____

_____

8. When do you make changes in your W-4 form?_____

_____

9. To whom do you report your tips? _____

10. If you earn less than _____ a month in tips, you do not have to report them.

11. Does your boss have to take out FICA on your tips? _____

12. What is the number of the form you use to record your tips on? _____

13. There are two, basic types of income tax forms. What numbers do they have?

_____

14. When a husband and wife are both included on one tax form, it is called a _____ return.

15. What is the W-2 form? How many copies do you get? What do you do with them?

_____

_____

16. What information is on the W-2 form? _____

_____

17. When you fill out the long form and itemize deductions, what are some of the deductions you can claim? _____

_____

_____

18. What do we mean by the term "standard deduction"? _____

19. What is an estimated tax form? _____

_____

20. What is a dividend? _____

21. What is the profit you earn on a savings account called? _____

22. Do you have to report extra income on your return? _____

23. How much is each exemption (allowance) worth today? _____

247

Form **4137**

Department of the Treasury
Internal Revenue Service

Computation of Social Security Tax on Unreported Tip Income

(Under Federal Insurance Contributions Act)
▶ Attach to Form 1040.

1974

Name of person who received tip income (as shown on social security card)	Social security number

Names of employers (If more space needed, list on other side)

_____

_____

1 Total cash tips received in 1974 (Note: Include December 1973 tips reported to your employer from January 1, 1974, through January 10, 1974. Do not include December 1974 tips reported to your employer from January 1, 1975, through January 10, 1975). See Instruction D . . . .

2 Total cash tips reported to your employer in 1974 . . . .

3 Balance (line 1 less line 2). Enter here and include in total on Form 1040, line 9 . . . .

4 Total cash tips received but not reported to employer because less than $20 in a calendar month . .

5 Balance (line 3 less line 4). Enter here and in item D below . . . .

6 Largest amount of wages (including tips) subject to social security tax . . **$13,200 | 00**

7 Total "F.I.C.A. Wages" shown on Form W-2. Enter here and in item E, below (include "covered" wages received as an agricultural or household employee) .

8 Balance (line 6 less line 7). If "zero," do not complete the rest of this form or Schedule U below . .

9 Unreported tips subject to F.I.C.A. tax—line 5 or 8, whichever is smaller. Enter here and give details in items A(1) through A(5) below . . . .

10 Multiply the amount on line 9 by 5.85 percent. Enter here and on Form 1040, line 59 . . . . . .

Do Not Detach

Important.—The amounts reported on the form below are for your social security record. This record is used in figuring any benefits, based on your earnings, payable to you, your dependents, and your survivors. Fill in each item accurately and completely.

SCHEDULE U (Form 1040)	U.S. Schedule of Unreported Tip Income	**1974**
Department of the Treasury Internal Revenue Service	For crediting to your social security record	

	Taxable tip income not reported to employer from line 9. See Instruction G.			Please Do Not Write in This Space	
A	(1) Jan.–Feb.–Mar.	$			
	(2) April–May–June				
	(3) July–Aug.–Sept.				
	(4) Oct.–Nov.–Dec.				
	(5) Total of lines A(1)–A(4)	$			

B	Occupation	Social security number of person named below ▶			Enter amount D from line 5, if any	$
	Print or type name of person who received tip income as shown on social security card					
C	Address (number and street)				E Enter amount from line 7	$
	City, State, and ZIP code	**248**			Do not write in this space DLN–	

Lesson 1	Profit and Loss Statement

Objective: You will learn how a businessman keeps track of how his business is making out.

Related Information:

Many small businesses fail because they are not operated efficiently. A businessman must know his costs, and in order to know them he must keep adequate records of what is going on.

We were introduced to some of these records when we discussed the costing of recipes and markup. The businessman must know how much to mark up in order to cover his costs and make a profit.

Before we get too far, let's review some words we will have to use to discuss this subject:

1. **Gross income:** All the money taken in by the business (the cash register receipts).

2. **Expenses:** All the money the businessman must pay out to keep in business. Here are some of the expenses:

   Materials used in processing foods
   Equipment, such as pots and pans
   Machinery
   Rent or property taxes (if he owns the property)
   Heat — gas and/or oil
   Electricity
   Telephone
   Materials used in cleaning
   Lawyer or accountant
   Printing for menus
   Garbage disposal
   Labor costs (pay to workers)
   Repairs
   Interest on money borrowed
   City and state taxes

3. **Net income:** What he has left after *subtracting* his expenses from his gross income.

BASIC RECORDS

In this and the following lesson you will learn about some of these records. They include:

The balance sheet

A sheet containing information on what the company is worth at a particular time — the value of the restaurant, money in the bank, debts owed, etc., etc.

Profit and loss statement (or Income statement)

A sheet showing income and expenses over a period of time, usually a month.

250

MONTHLY PROFIT AND LOSS STATEMENT

Date: September 30, 19—

			% of SALES
Sales		$ 20,000	100
Inventory-beginning of month	$ 2,000		
Food purchases for month	$ 8,500		
Total	$10,500		
Less final inventory	$ 1,500		
		$ 9,000	45
Gross Income		$ 11,000	55
Operating Expenses			
Salaries and Wages	$ 6,000		30
Rent	1,400		7
Laundry	200		1
Paper and cleaning supplies	200		1
Utilities	600		3
Replacements, repairs, and maintenance	400		2
Depreciation	400		2
Advertising	100		0.5
Taxes & Insurance	400		2
Miscellaneous	300		1.5
Total Expenses:		$ 10,000	50
Net Income (Profit)		1,000	5

The Profit and Loss Statement

This is usually computed for each month. It summarizes the business as follows:

Sales (as shown on the register)
- Cost of food sold
= Gross income

Gross income
- All other operating expenses
= Net income or profit

How to read the profit and loss statement:

1. **Sales.** These came to $20,000 for the month. This represents 100%.

2. **Food Costs:**

On hand at beginning of the month	$2000	
Additional food purchased	$8500	
	$10500	
Inventory (what is left) at the end of the month	$1500	
Subtract what is left from total. =	$9000, food used during month.	

(The food cost of $9000 is 45% of the $20,000 in sales.)

3. **Gross income:** Subtract the food cost from the sales.

$$\begin{array}{r} \$\ 20000 \\ -\ \ \ 9000 \\ \hline \$\ 11000 = \text{gross income} \end{array}$$

4. **Operating expenses:** Add them all up. Total is $10,000.
   (The expenses amount to 50% of the sales.)

5. **Net Income:** Subtract the operating expenses from the gross income.

$$\begin{array}{r} \$\ 11000 \\ -10000 \\ \hline \$\ 1000 \ \ \text{Net income or profit.} \end{array}$$

The profit of $1000 is 5% of the $20,000 of sales.

Of course, the boss's salary is included in the "Salaries and Wages" item, so, while the business made 5% on total sales, he also made his own salary to put in his pocket. We'd say that this businessman was doing rather well.

252

ASSIGNMENT:

1. Define the following words used on the monthly profit and loss statement:

   a. Sales _____

   b. Inventory _____

   c. Gross income _____

   d. Operating expenses _____

   e. Depreciation _____

   f. Miscellaneous _____

   g. Profit _____

2. Your food sales for the month were $18,450.00, your food costs, $7,329.00. What was your gross income? If your operating expenses came to $10,105.00, what was your profit?

3. Prepare a balance sheet using the following information. (Set it up like the one on page 242.)

Food sales	$ 33,180.24
Food cost	$ 14,100.15
Expenses	
Salaries and wages	$ 12,521.42
Employees' meals	874.00
Laundry	659.00
Sundry supplies and expenses	346.08
Repairs	117.25
Heat, light, power, water, telephone	520.18
Insurance	187.32
Rent	450.00
Depreciation-furniture and fixtures	122.00
Legal services	186.00
Interest expense	90.00
Payroll taxes	754.18
Allowance for state and Federal taxes	750.00
Miscellaneous	150.00

   Did the restaurant show a profit or a loss for the month? _____

   How much was it? _____

253

Objective: You will learn how an annual balance sheet shows the net worth of a business.

Related Information:

  Balance sheets may be made up as often as needed, but they are always made up at least once a year. The end-of-year statement (annual report) shows the financial position of the business on that particular day. It is important for a businessman to know what his business is worth at the end of each year.

Terminology:

Assets: The things the company owns: goods, food supplies, machinery, etc.

Fixed assets: Those assets that cannot be moved: equipment, furniture, etc. They can be used over and over.

Depreciation: Loss in value as a fixed asset wears out or becomes old.

Liabilities: What the company owes: unpaid bills, loans.

Net worth: The amount remaining when you subtract liabilities from the assets.

      Assets
     – Liabilities
     = Net worth

  You will not be required to make an annual report, but you should be able to understand this report.

254

Balance Sheet or Annual Report

ANNUAL REPORT

December 31, 19—

CURRENT ASSETS

Cash	$ 9,000	
Food inventory	1,500	
Other (Deposits with Public Utilities)	250	
Total Current Assets		$ 10,750

FIXED ASSETS

Large equipment	$ 25,000	
Dining room fixtures	15,000	
Small kitchen equipment	2,000	
China, glass, silver, linens	2,500	
Miscellaneous	2,000	
Total Fixed Assets		$ 46,500
Total Assets		$ 57,250

CURRENT LIABILITIES

Accounts payable	$ 6,000	
Installment accounts	$ 11,000	
Total Liabilities		$ 17,000

NET WORTH $ 40,250

ASSIGNMENT:

1. An inventory of fixed assets in the cafeteria showed these items:

Number	Items	Value	Extension
30	Tables	$ 35.50 each	_____
180	Chairs	12.00 each	_____
40 doz	Glasses	2.00/doz	_____
30 doz	Cups and saucers	6.70/doz	_____
20 doz	Bowls	9.05/doz	_____
20 doz	Dishes, large (dinner)	11.80/doz	_____
30 doz	Dishes, medium	8.80/doz	_____
16	Platters	2.00 each	_____
30 doz	Knives	4.00/doz	_____
30 doz	Forks	1.80/doz	_____
42 doz	Teaspoons	1.00/doz	_____
22 doz	Tablespoons	1.80/doz	_____
14 doz	Trays	14.40/doz	_____
2	Stoves	800.00 each	_____
1	Deep fryer	438.00	_____
1	Dishwasher	1845.00	_____
1	Refrigerator	1138.00	_____
1	Freezer	1500.00	_____
1	Mixer	509.00	_____
1	Slicer	205.00	_____
36	Sugar servers	7.20/doz	_____
36	Salt cellars	2.40/doz	_____
36	Condiments	3.50/doz	_____
	Total		_____

2. Total up the *fixed assets* listed above. _____

3. Use the food-inventory list from the lesson on inventory (page 133) and determine the food inventory for a balance sheet or annual report.

4. Your total assets amounted to $15,975.00. Your liabilities $1,700.00. What is your net worth? _____

256

CONVERSION CHART
(The weights given here are all approximate)

Food Product	Tbsp.	Cup	Pint	Quart
Allspice	1/4 oz	4 ozs	8 ozs	1 lb
Apples, fresh, diced		8 ozs	1 lb	2 lbs
Bacon, raw, diced		8 ozs	1 lb	2 lbs
Bacon, cooked, diced		10½ ozs	1 lb 6 ozs	2 lbs 12 ozs
Bananas, sliced		8 ozs	1 lb	2 lbs
Baking powder	1/2 oz	6 ozs.	12 ozs.	1 lb 8 ozs
Baking soda	1/2 oz.	8 ozs	1 lb	2 lbs
Beef, cooked, diced		5½ ozs	11 ozs.	1 lb 6 ozs
Beef, raw, ground		8 ozs	1 lb	2 lbs
Barley	1/2 oz	8 ozs	1 lb	2 lbs
Bread crumbs, dry	1/4 oz	4½ ozs	9 ozs	1 lb 2 ozs
Bread crumbs, fresh		2 ozs	4 ozs	8 ozs
Butter	1/2 oz	8 ozs	1 lb	2 lbs
Cabbage, shredded		4 ozs	8 ozs	1 lb
Carrots, raw, diced		5 ozs	10 ozs	1 lb 4 ozs
Celery, raw, diced		4 ozs	8 ozs	1 lb
Cheese, diced		5½ ozs	11 ozs	1 lb 6 ozs
Cheese, grated or shredded	1/4 oz	4 ozs	8 ozs	1 lb
Chocolate, grated	1/4 oz	4 ozs	8 ozs	1 lb
Chocolate, melted	1/2 oz	8 ozs	1 lb	1 lb
Cinnamon, ground	1/4 oz	3½ ozs	7 ozs	14 ozs
Cloves, ground	1/4 oz	4 ozs	8 ozs	1 lb
Cloves, whole	1/4 oz	3 oz	6 ozs	12 ozs
Cocoa	1/4 oz	3½ ozs	7 ozs	14 ozs
Coconut, shredded, packed	1/4 oz	3½ ozs	7 ozs	14 ozs
Coffee, ground	1/4 oz	3 ozs	6 ozs	12 ozs
Cornmeal	1/3 oz	4¾ ozs	9½ ozs	1 lb 3 ozs
Cornstarch	1/3 oz	5¼ ozs	10½ ozs	1 lb 5 ozs
Corn syrup	3/4 oz	12 ozs	1 lb 8 ozs	3 lbs
Cracker crumbs	1/4 oz	4 ozs	8 ozs	1 lb
Cranberries, raw		4 ozs	8 ozs	1 lb
Currants, dried		5½ ozs	11 ozs	1 lb 6 ozs
Curry powder	1/4 oz	3½ ozs		
Dates, pitted		5½ ozs	11 ozs	1 lb 6 ozs
Egg whites	1/2 oz	8 ozs	1 lb	2 lbs
Eggs, whole	1/2 oz	8 ozs	1 lb	2 lbs
Egg yolks	1/2 oz	8 ozs	1 lb	2 lbs
Extracts	1/2 oz	8 ozs	1 lb	2 lbs
Flour, bread	1/3 oz	5 ozs	10 ozs	1 lb 4 ozs
Flour, pastry	1/3 oz	5 ozs	10 ozs	1 lb 4 ozs
Flour, cake	1/3 oz	4¾ ozs	9½ ozs	1 lb 3 ozs
Gelatin, flavored	3/8 oz	6½ ozs	13 ozs	1 lb 10 ozs
Gelatin, plain	1/3 oz	5 ozs	10 ozs	1 lb 4 ozs

248

Food Product	Tbsp.	Cup	Pint	Quart
Ginger	1/4 oz	3¼ ozs	6½ ozs	13 ozs
Glucose	3/4 oz	12 ozs	1 lb 8 ozs	3 lbs
Green peppers, diced	1/4 oz	4 ozs	8 ozs	1 lb
Ham, cooked, diced		5¼ ozs	10½ ozs	1 lb 5 ozs
Horseradish, prepared	1/2 oz	8 ozs	1 lb	2 lbs
Jam	5/8 oz	10 ozs	1 lb 4 ozs	2 lbs 8 ozs
Lemon juice	1/2 oz	8 ozs	1 lb	2 lbs
Lemon rind	1/4 oz	4 ozs	8 ozs	1 lb
Mace	1/4 oz	3¼ ozs	6½ ozs	13 ozs
Mayonnaise	1/2 oz	8 ozs	1 lb	2 lbs
Milk, liquid	1/2 oz	8 ozs	1 lb	2 lbs
Milk, powdered	1/4 oz	4½ ozs	9 ozs	1 lb 2 ozs
Molasses	3/4 oz	12 ozs	1 lb 8 ozs	3 lbs
Mustard, ground	1/4 oz	3¼ ozs	6½ ozs	13 ozs
Mustard, prepared	1/4 oz	4 ozs	8 ozs	1 lb
Nutmeats	1/4 oz	4 ozs	8 ozs	1 lb
Nutmeg, ground	1/4 oz	4¼ ozs	8½ ozs	1 lb 1 oz
Oats, rolled	1/4 oz	3 ozs	6 ozs	12 ozs
Oil, salad	1/2 oz	8 ozs	1 lb	2 lbs
Onions, chopped	1/3 oz	5½ ozs	11 ozs	1 lb 6 ozs
Peaches, canned		8 ozs	1 lb	2 lbs
Peas, dry, split	1/2 oz	7 ozs	14 ozs	1 lb 12 ozs
Pickles, chopped	1/3 oz	5¼ ozs	10½ ozs	1 lb 5 ozs
Pickle relish	1/3 oz	5¼ ozs	10½ ozs	1 lb 5 ozs
Pineapple, diced	1/2 oz	8 ozs	1 lb	2 lbs
Pimentos, chopped	1/2 oz	7 ozs	14 ozs	1 lb 12 ozs
Potatoes, cooked, diced		6½ ozs	13 ozs	1 lb 10 ozs
Prunes, dry		5½ ozs	11 ozs	1 lb 6 ozs
Raisins, seedless	1/3 oz	5¼ ozs	10½ ozs	1 lb 5 ozs
Rice, raw	1/2 oz	8 ozs	1 lb	2 lbs
Salmon, flaked		8 ozs	1 lb	2 lbs
Sage, ground	1/8 oz	2¼ ozs		
Savory	1/8 oz	2 ozs		
Salt	1/2 oz	8 ozs	1 lb	2 lbs
Shortening	1/2 oz	8 ozs	1 lb	2 lbs
Sugar, brown, packed	1/2 oz	8 ozs	1 lb	2 lbs
Sugar, granulated	1/2 oz	7½ ozs	15 ozs	1 lb 14 ozs
Sugar, powdered	1/3 oz	4¾ ozs	9½ ozs	1 lb 3 ozs
Tapioca, pearl	1/4 oz	4 ozs	8 ozs	1 lb
Tea	1/6 oz	2½ ozs	5 ozs	10 ozs
Tomatoes	1/2 oz	8 ozs	1 lb	2 lbs
Tuna fish, flaked	1/2 oz	8 ozs	1 lb	2 lbs
Vanilla, imitation	1/2 oz	8 ozs	1 lb	2 lbs
Vinegar	1/2 oz	8 ozs	1 lb	2 lbs
Water	1/2 oz	8 ozs	1 lb	2 lbs